QH
1
.N2853
NH

The Naturalist

August 2012
Volume 137
Number 1080

Yorkshire Naturalists' Union

Journal of Natural History for the North of England

The Naturalist
Vol. 137 No. 1080 August 2012

Contents

An asterisk* indicates a peer-reviewed paper

Front cover: Juvenile Kittiwake (see p113) Photo: C. West
Back cover: Juvenile Dormouse in tree at Freeholders' Wood, May 2011 (see p82) Photo: R. Gaynor

Yorkshire Naturalists' Union

The Naturalist

August 2012 Volume 137 Number 1080

Editorial

A year ago we presented an issue of *The Naturalist* containing several articles about natural history around Leeds. With this issue we have articles relating to the Scarborough district. The editors are grateful to the members of the Scarborough Field Naturalists' Society and the Yorkshire Naturalists' Union and others for contributing these articles. We hope to produce an issue next year which contains a group of articles relating to another part of Yorkshire. If you are willing to co-ordinate such a series of articles then please get in touch with us.

While the two issues so far have dealt with a city and a town, it is not necessary to cover such large areas every time. The wildlife of a village, a parish, a river valley or even an individual site could form the subject of such an issue. As with the Leeds and Scarborough ones, we welcome information on history, management and conservation issues as well as articles on particular groups or even individual species of animals and plants. You will see from this issue that articles can range from a single page to several pages. We are keen to encourage contributions from naturalists who may never have written articles for publication before and short notes on their experiences would be a gentle first step in sharing their knowledge with the rest of us. The 'Notice to Contributors' on the inside back cover applies to such articles.

The themed issues benefit enormously from good photographs as, indeed, does every issue of *The Naturalist*. We cannot pay for using your photographs but the photographer is credited in each one. We are very grateful when members offer us the use of their work so please contact us if you have photographs which you would be willing to see in future issues.

SMITHSONIAN
SEP 12 2012
LIBRARIES

The Hazel Dormouse release project at Freeholders' Wood in the Yorkshire Dales National Park

I. White People's Trust for Endangered Species, 15 Cloisters House, 8 Battersea Park Road, London, SW8 4BG
email: Ian.White@ptes.org

I.R. Court Yorkshire Dales National Park Authority, Colvend, Hebden Road, Grassington, Skipton, North Yorkshire, BD23 5LB.
email: ian.court@yorkshiredales.org.uk

Abstract
The Hazel Dormouse *Muscardinus avellanarius* has become extinct in Yorkshire over the past 100 years. There have been two previous attempts to establish a breeding population in the county which may have been successful. A third re-introduction was undertaken in Freeholders' Wood in 2008; this required a slight change in the management of the wood, an input from a variety of organisations and the help of a number of volunteers. To date the project appears to be successful with good dormouse numbers recorded and evidence that the species has at least dispersed throughout the woodland.

Introduction
In 1885 Rope identified a number of locations in Yorkshire at which the Hazel Dormouse had been recorded. Howes (1985) noted some more recent records from the 1950s and 1960s; and although there were a couple of records from 1979 and 1980, these were not substantiated (Oxford 1999). The next national survey on this species was not undertaken until 1993 when the first Great Nut Hunt provided very good evidence that dormice had become extinct in the county of Yorkshire during the preceding hundred years.

The Hazel Dormouse was once widespread in woods throughout Britain but the Great Nut Hunt showed that, apart from populations in Cumbria and Northumberland, the Dormouse had been lost from Yorkshire and at least six other northern and midland English Counties. Further research work on the species showed that not only had the range reduced but also the population had diminished significantly over the past 100 years (Bright & Morris 1995, Sanderson 2001). The loss was chiefly thought to be due to the isolation of woods, changes in woodland management and both the loss and inappropriate management of hedgerows. The species is very sensitive to environmental factors and so the woodlands and scrub they inhabit needs to be well managed at both the local and landscape level.

Due to the apparent decline of the Hazel Dormouse, the species was granted protection under the Wildlife and Countryside Act 1981 and this has been enhanced by the Conservation of Habitat and Species Regulations 2010. A national Biodiversity Action Plan (BAP) for dormice was instigated in 1995 to help conserve the species, aiming to "maintain, enhance and re-establish dormouse populations within their historic range". To achieve this, the National Dormouse Monitoring Programme (NDMP) was set up to examine the national population trend of the Hazel Dormouse by the regular monitoring of a large number of sites where dormice are known to exist. This has shown that the dramatic population decline in the past 50 years finally appears to be slowing and over the past 20 years there has been an effort to return the Dormouse to some of the counties from which it has been lost or where its numbers are low. The species has been re-introduced to 17 sites in 11 counties since the first re-introduction took place in Cambridgeshire in 1993. Unfortunately the releases at three of these sites do not appear to have been successful, probably due to inappropriate or

insufficient woodland management. Dormice have survived at nine of the sites and have dispersed throughout the woodland in which they were released. At four sites however, the dormice have not only dispersed throughout the wood but they are now starting to move out of the woodland into the wider countryside (Mitchell-Jones & White 2009). The most recent re-introduction took place in 2010 in Warwickshire and it is too early to provide an accurate assessment of the status of the population.

The first re-introduction in Yorkshire was undertaken in 1999 in a private woodland in the North York Moors National Park near to the village of Helmsley. This release and the later monitoring work has been well documented by Geoff Oxford (Oxford 1999, 2000, 2002, 2003, 2004, 2006, 2007a, 2007b, 2008). A further re-introduction in Yorkshire was undertaken in 2004 in another privately owned woodland near to Masham. Following the successful re-introduction into the second site, Freeholders' Wood was assessed for suitability in winter 2007 and the People's Trust for Endangered Species, Yorkshire Dales National Park Authority, Natural England and the Common Dormouse Captive Breeders Group decided to use the site for another re-introduction site in North Yorkshire in 2008.

Freeholders' Wood is in the eastern part of the Yorkshire Dales National Park (YDNP), within the district of Richmondshire (VC65) near Carperby, Wensleydale. It is 14.87ha of semi-natural ancient woodland that has been wooded since at least 1778. The woodland is owned by the Yorkshire Dales National Park Authority and is registered common land, with 30 properties in the village of Carperby having the right to gather or cut underwood between Oct 1st and March 31st. It is the only semi-ancient natural woodland in the YDNP which is coppiced with standards management and for this reason was designated a Site of Special Scientific Interest (SSSI) in 1988.

The woodland is predominantly Hazel *Corylus avellana* with at least 80% of the tree cover, with the remainder comprising of Ash *Fraxinus excelsior*, Holly *Ilex aquifolium,* Wych Elm *Ulmus glabra* and Downy Birch *Betula pubescens*. The understorey is predominantly Hawthorn *Crataegus monogyna*, Bird Cherry *Prunus padus*, Blackthorn *Prunus spinosa* and Rowan *Sorbus aucuparia*. Guelder Rose *Viburnum opulus*, Spindle *Euonymus europaeus*, Wild Cherry *Prunus avium*, Apple *Malus* spp. and Buckthorn *Rhamnus catharticus* are also found within the woodland but are uncommon.

Methodology

Coppicing work was reinstated in the winter of 1983/84 in Freeholders' Wood after consultation with the freeholders and Natural England and the coupes were originally planned to be cut on a 15 year rotation. When the decision was taken to release dormice into the wood the coppice management regime was amended slightly to make it more sympathetic to the species. A buffer zone is now left around each coppice coupe adjacent to the roads and the disused railway line. This is an area where mature, fruiting hazels are retained and as well as providing suitable habitat in its own right it will also act as an arboreal corridor to allow dormice to access the recently cut coppice coupes as they become suitable.

In Spring 2008 nearly 200 dormice nest boxes, as detailed in the Dormouse Conservation Handbook (Bright *et al.,* 2006), were put up within the wood in order to enable future monitoring work to be undertaken, along with 15 soft release cages. (Fig 1.).

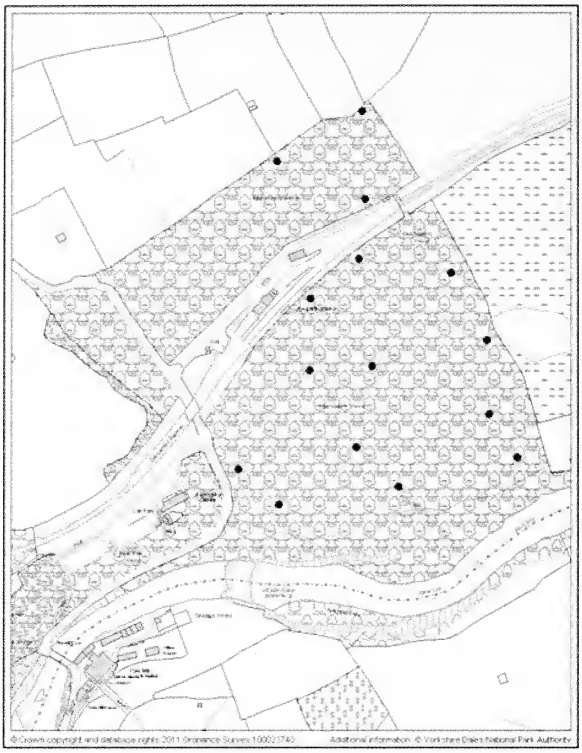


Fig. 1. The location of the soft release cages in Freeholders' Wood, June 2008

The release protocol was in accordance with the methodology established by Bright and Morris (1994). On 23rd June 2008, 35 captive bred animals were brought to Freeholders Wood. These animals had been bred within an established dormouse captive breeding programme and had been in quarantine for the previous six weeks to ensure any pathogens they had from captivity would not be introduced into the wild. Twelve females and seven males were sent from London Zoo (Zoological Society of London) and eight females and eight males from Paignton Zoo. The animals were put in mixed pairs in nest boxes in the release cages and remained within the cages for about 10 days. After this time small openings were made in the cages to enable the animals to move out into the woodland but still providing them with the security of the release cage. The dormice were fed while they were in the cages from 21st July until 3rd August and continued to be fed twice a week until 4th September. The feeding was finally stopped on September 8th when no further food was taken.

The monitoring work was then undertaken in accordance with the National Dormouse Monitoring Program survey guidelines (PTES 2011) with nest boxes checked by licenced fieldworkers once each month from May to October. The number of boxes that contained distinctive dormouse nests but no dormice were recorded and simple biometric data were recorded on any dormice found. This included sex, weight, breeding condition and number of young and in addition, each animal was aged as either an adult (i.e. an animal that has survived at least one winter) by the orange-brown colour of the fur, or as a juvenile (i.e. independent young in their first year with a weight of >10g) with more brownish fur than an adult. Any young were classed as pink (no fur), grey (grey fur and eyes still closed) or eyes open (with grey-brown fur and eyes open).

Although there have been three dormouse releases in Yorkshire, Freeholders' Wood is the only site in the county where there has been persistent and ongoing management since the release. It was therefore decided to compare the results at Freeholders' with a similar re-introduction site in the south. In June 2006, 34 dormice were re-introduced into the wild at Bradfield Woods, a 72 hectare site in Suffolk. Although the woodland is substantially larger than Freeholders' Wood, it has a similar management regime.

Results

Initially three animals were known to have died at Freeholders' Wood in the first year with two females and one male dying between June 24th and July 9th 2008. It was not possible to establish the cause of death. In September 2008 a group of local volunteers from the YDNP, carried out the first box check and found 58 dormice in 19 nest boxes, plus a further 32 boxes with empty nests in them. This was an encouraging 26% occupancy of the total 195 boxes placed throughout the woodland. The largest litter that was found was of eight young. In total, 21 of the 58 animals found were under 7g with 15 of the animals caught originating from the original group released including six females and nine males. The remainder consisted of nine females, eleven males and 23 which were not old enough to be sexed (see Plate I, centre pages).

The distances that the dormice travelled from their release cages until they were checked in September varied from 10m to 280m. Three animals crossed the railway that runs through the middle of the wood and one female, originally released near the Falls path, travelled 280m to a box in the north-western corner of newly coppiced plots north of the railway line.

Table 1. Dormice recorded at Freeholders' Wood, North Yorkshire from the release date in June 2008 to 2011.

Survey date	Total no. of dormice	No. of boxes occupied	No. of empty nests	No. of boxes checked	% box occupancy	No. of dormice per 50 boxes checked
23/06/2008	35		n/a	n/a		n/a
29/09/2008	58	19	32	195	26.2	14.8
23/10/2008	39	18	34	198	26.2	9.85
22/04/2009	6	6	0	229	2.6	1.31
21/06/2009	25	11	4	229	10.0	5.02
22/07/2009	18	8	17	249	12.2	3.93
21/08/2009	13	6	22	229	16.2	2.84
22/09/2009	40	10	27	229	18.3	8.73
22/10/2009	36	14	28	229	6.3	7.50
26/05/2010	8	5	10	240	10	1.67
23/06/2010	29	12	12	240	15.4	6.04
20/07/2010	13	7	25	240	17.5	2.71
23/09/2010	17	7	35	240	14.2	3.54
29/10/2010	8	7	27	240	7.9	1.57
23/05/2011	16	15	5	254	7.5	3.14
28/06/2011	9	5	14	254	11.4	1.77
18/07/2011	13	6	24	254	11.8	2.56
15/08/2011	13	7	28	254	13.8	2.56
26/09/2011	39	11	11	254	8.6	7.68
12/10/2011	15	6	11	169	10.1	4.44

In April 2009 six individual animals were recorded in separate boxes; five of these were animals that had been released the previous summer and one was an unmarked 21g adult male that must have been born at Freeholders'. In the check on 21st June 2009 a total of 25 dormice were recorded of which 11 were adults and 14 were nestlings or unweaned young.

This trend continued into September when 40 dormice were recorded of which two were dead, 8 were adult, 4 were juveniles and 28 or 70% were nestlings. In total 8 litters of pink young were recorded in the six box checks, the largest with nine young in September. The heaviest dormice in 2009 were two males at 34g found in October. In May 2010 eight dormice were recorded, none of which were marked and so all had been born at Freeholders' Wood. In June, two marked adults were found along with 14 unmarked adults and four litters of young. In September 16 dormice were recorded and eight in the October check (Table 1).

At Bradfield Wood in Suffolk dormice have been monitored in May, June, September and October since the re-introduction took place in June 2006. To allow for a comparison between the two sites the numbers of dormice recorded were adjusted to the numbers recorded per 50 boxes and compared on year from release (Figs. 2 and 3).

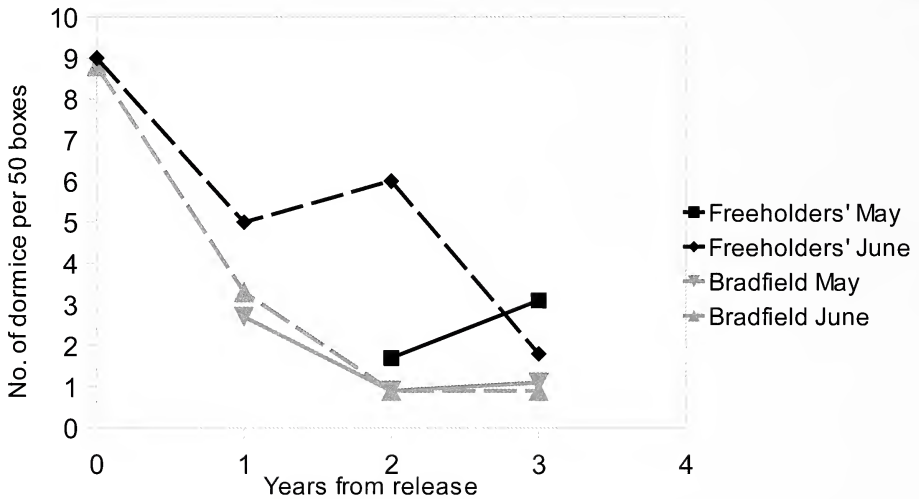


Fig 2. The number of dormice recorded at Freeholders' Wood and Bradfield Wood per 50 boxes in May and June, adjusted to years from release.

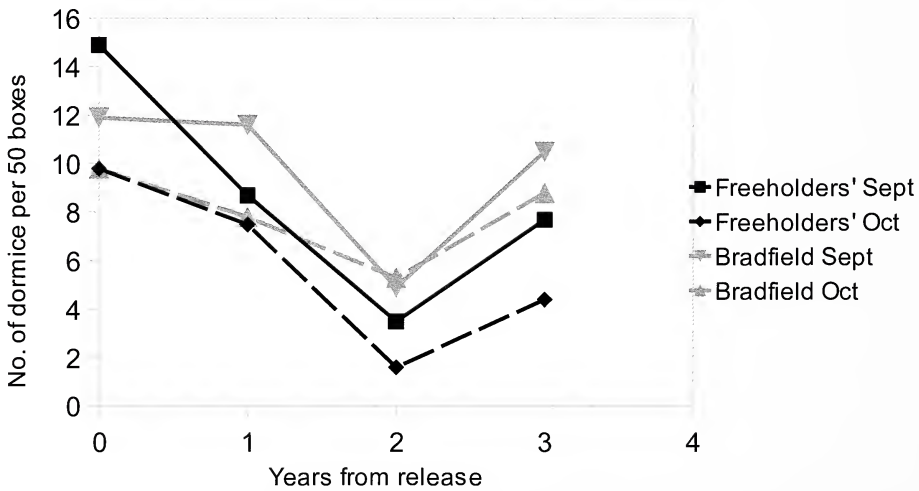


Fig 3. The number of dormice recorded at Freeholders' Wood and Bradfield Wood per 50 boxes in September and October, adjusted to years from release.

Discussion

The Freeholders' site is the third re-introduction of dormice into North Yorkshire but the size, nature and management of the three sites in the county is very different. It has been suggested that 20 hectares is the minimum habitat area to support a viable population of dormice (Bright *et al.,* 1994) and hence the initial Yorkshire release site in 1999 at 22 hectares was considered to be of a suitable size. It also formed part of a larger area of coppice woodland but the coppice in the area had not been worked for a number of years and had become overstood and shaded by the developing tree canopy. The second Yorkshire site was, like the first, in private ownership and the release in 2004 was undertaken in two adjacent woods that were connected by hedgerows. The sizes of the woods were approximately 24 hectares and 14 hectares respectively and although there were areas of suitable dormouse habitat, the majority of the woodland was managed as high forest. Freeholders' Wood is the first re-introduction site in Yorkshire where there is a current and ongoing coppice management regime that is considered to provide optimal habitat for dormice. The wood is approximately 15 hectares in area which may be considered to be too small for a self-sustaining dormouse population but the positive ongoing management and the possibility of providing habitat links to other suitable areas made it a good choice at which to release dormice. Bradfield Wood in Suffolk may be considered to be an even better wood for the Hazel Dormouse. At over 70 hectares, the woodland is three and a half times the size suggested to support a viable population and it has an ongoing coppice management programme and a deer management programme to encourage good woodland regeneration.

Similar numbers of dormice were released at both sites and both have shown a decline in the numbers recorded in May and June. This is probably the result of high initial mortality of the dormice and may be the consequence of the use of captive bred animals on the release. At Bradfield, the May/June population reduced to approximately one dormouse per 50 boxes after two years and remained at that level in year three. In contrast, the spring trend at Freeholders' shows a general reduction in numbers but an increase in the number recorded in May. Although the records are limited, the increase in May records may be indicative of better hibernal survival at the northern site.

The number of dormice recorded at the Bradfield site in September and October is higher than at Freeholders' Wood and this may be the consequence of a greater area of immediate available habitat at the southern site or improved food availability leading to better breeding success. The population trend at the two sites in the autumn months is almost identical. The high numbers recorded in the release year drop to their lowest level in year 2 following the release. This further suggests that there is a high mortality of dormice following the release but once the population stabilises it begins to increase in Year 3. In 2010 or Year 4 following the release, Bradfield recorded over 21 dormice per 50 boxes in September and over 13 dormice per 50 boxes in October. If the trends in the recorded numbers at the sites continue this suggests that in the autumn checks in 2012, Freeholders' Wood could record approximately 78 dormice in September and 23 in October.

There is a concern that at the original Yorkshire site the dormouse population may have become extinct or it may have moved, as no animals have been recorded at the site since 2008. At the second site the population appears to have stabilised at a relatively low level with approximately one dormouse recorded in 25 boxes in the autumn months. Freeholders' Wood, which has a woodland management work programme that is likely to be best suited to the dormouse habitat requirements appears to be following a population trend similar to one

at a southern site in Suffolk, where high numbers of dormice are now recorded. It is to be hoped that the trend will continue.

Acknowledgements
The dormouse release in Freeholders' Wood has been a collaborative project between People's Trust for Endangered Species and the Yorkshire Dales National Park Authority and is supported by Natural England. The release would not have been possible without the enthusiasm of Tim Thom, who instigated the original release program on behalf of the YDNPA, Paul Sheehan from the YDNPA and all the Dales volunteers who have made it a success.

References

Bright, P.W. and Morris, P.A. (1994) Animal translocation for conservation: performance of dormice in relation to release methods, origin and season. *Journal of Applied Ecology 31: 699-708*

Bright, P.W., Mitchell, P. and Morris, P.A. (1994) Dormouse distribution: survey techniques, insular ecology and selection of sites for conservation. *Journal of Applied Ecology 31: 329-339*

Bright, P.W. and Morris, P.A (1995) A review of the dormouse *(Muscardinus avellanarius)* in England and a conservation programme to safeguard its future. *Hystrix (n.s.) 6(1-2): 295-302.*

Bright, P., Morris, P. and Mitchell-Jones, T. (2006) The Dormouse Conservation Handbook 2nd ed. Natural England

Howes, C.A. (1995) Dormouse *Muscardinuas avellanarius in* M.J.Delaney *Yorkshire Mammals*. University of Bradford pp132-135

Mitchell-Jones, A. and White, I. (2009) Using reintroductions to reclaim the lost range of the dormouse, *Muscardinus avellanarius*, in England. *Folia Zool. 58(3): 341–348*

Oxford, G. (1999) Dormice in Yorkshire – the return of the native. *Imprint (The Yorkshire Mammal Group Newsletter) 26*

Oxford, G. (2000) The woodlanders – an update on Yorkshire's dormice. *Imprint (The Yorkshire Mammal Group Newsletter) 27*

Oxford, G. (2002) Under the greenwood tree – annual update on Yorkshire's reintroduced dormouse population. *Imprint (The Yorkshire Mammal Group Newsletter) 29*

Oxford, G. (2003) Yorkshire dormouse update 2003. *Imprint (The Yorkshire Mammal Group Newsletter) 30*

Oxford, G. (2004) The original dormouse re-introduction – update for 2004. *Imprint (The Yorkshire Mammal Group Newsletter) 31*

Oxford, G. (2006) The original dormouse re-introduction – update for 2005 and 2006. *Imprint (The Yorkshire Mammal Group Newsletter) 33*

Oxford, G. (2007a) The original dormouse reintroduction – update for 2007. *Imprint (The Yorkshire Mammal Group Newsletter) 34*

Oxford, G. (2007b) The Hazel dormouse (*Muscardinus avellanarius*) re-introduction to North Yorkshire. *The Naturalist 132 (1060): 3-8*

Oxford, G. (2008) The original dormouse reintroduction – Tenth anniversary. *Imprint (The Yorkshire Mammal Group Newsletter) 35*

PTES. (2011) National Dormouse Monitoring Programme Survey Guidelines and Recording Forms 2011. London.

Rope (1885) On the range of the dormouse in England and Wales. *The Zoologist 9 102: 201-220*

Sanderson, F.(2004) The population ecology and monitoring of the dormouse *Muscardinus avellanarius*. PhD Submission. University of London.

When did the Weasel first appear in the Yorkshire fauna?

C. A. Howes 7 Aldcliffe Crescent, Balby, Doncaster DN4 9DS
email: colinhowes@blueyonder.co.uk

The extensive and disparate body of evidence from Quaternary, archaeological, topographical, etymological, literary, local history and folklore sources, provides little information on the origins and history of the Weasel *Mustela nivalis* in Yorkshire.

Quaternary and Archaeological Sources

No evidence of Weasel has yet been confirmed from cave faunas listed for any of the Yorkshire cave sites (Jenkinson, 1984; Yalden, 1999; Chamberlain, 2002). Skeletal remains figured as "Weasel" in Buckland (1823) from Pleistocene deposits in Kirkdale Cave, North Yorkshire, now attributed to the climatic optimum (Zone II) of the Ipswichian Interglacial (Boylan, 1981), were subsequently deemed to refer to Stoat *M. erminea* (Rutter, 1956). Skeletal remains attributable to Weasel were identified in two sedimentary strata (a single bone in each) within Pin Hole Cave, Creswell, on the Derbyshire/Nottinghamshire border near the border with South Yorkshire. These occurred in a cold phase glacial context characterised by the presence of Woolly Rhinoceros *Coelodonta antiquitatis*, Reindeer *Rangifer tarandus* and Arctic Lemming *Dicrostonyx torquatus* (Jenkinson, 1984).

Skeletal material from excavations at the Mesolithic seasonal hunting camps by the River Kennet at Thatcham, Berkshire (10,050-9,600 b.p) (King, 1962), and Star Carr at the eastern end of the Vale of Pickering, North Yorkshire (9,488 b.p.) (Fraser & King, 1954), produced evidence of a mammal fauna of temperate forest and lakeside habitats. This, with the exception of Elk *Alces alces*, Aurochs *Bos primigenius* and Tarpan *Equus ferus*, included a broad representation of species which occurred in Britain through to historic times. Although the carnivora were represented by Brown Bear *Ursus arctos*, Wolf *Canis lupus*, Red Fox *Vulpes vulpes*, Wildcat *Felis silvestris*, Pine Marten *Martes martes* and Badger *Meles meles*, no evidence of the small mustelids (Weasel or Stoat) was identified.

Despite the presence of potential prey species of Woodmouse *Apodemus sylvaticus* and Bank Vole *Clethrionomys glareolus* in the woodlands at that time, as demonstrated in the fauna (dated at 9,960 b.p.) at Cresswell Crags, North Nottinghamshire (Jenkinson 1984), there was still no evidence of either Weasel or Stoat. Their absence or relative scarcity could suggest a dependence on pastoral rodents such as Field Vole *Microtis agrestis* rather than woodland rodents. The scarcity or absence of widespread open grassy habitats has been demonstrated by pollen zone VIIa evidence from across southern Britain, with deciduous woodland habitat blanketing both upland and lowland between 7,000 and 5,000 b.p. (Yalden, 1999). At this time, the fortunes of open grassland rodents and their small mustelid predators, if they occurred at all, may have depended on the opening up and maintenance of grassy glades by large herbivores such as Aurochs, Red Deer *Cervus elaphus* and Roe Deer *Capreolus capreolus*. Over the succeeding 3,000 years much of this woodland was felled and recolonisation prevented by the pastoral and arable practices of Neolithic farmers (Yalden, 1999). Although it is possible that Weasel and Stoat could have become widespread during this period, they still remain absent from the archaeological record.

The earliest, if problematic, claimed post-glacial Weasel material is from a Bronze Age barrow at Gristhorpe, near Scarborough, where "calcined" bones were found in an oak-trunk coffin and deemed to be Weasel by William Buckland (Williamson, 1872; Rutter, 1956).

Subsequent examination by Drs N D. Melton and J. Bond during a cooperative project between the University of Bradford and Scarborough Museums Trust, has shown these bones to consist of 1 metatarsal of Fox and 5 phalanges of Pine Marten (N.D. Melton pers. comm.).

The absence of material evidence in bone assemblages from cave or archaeological sites from the Pleistocene through to medieval strata suggests that the Weasel may have been scarce or absent from the Yorkshire fauna until relatively recent times, certainly after the land-bridge with the continent had submerged beneath the rising North Sea about 9,500 years b.p. It may even suggest that the Weasel could have been introduced as late as historic times.

Etymological and Literary Sources

Despite the absence of material evidence into historic times, a knowledge of Weasel is shown by written references to the animal in England at least from the 8th century and in Yorkshire from the 14th century, with it having sufficient impact on the rural economy to be regarded as "vermin" from the 16th century. According to sources in the *Oxford English Dictionary* (1989), the term 'weasel' (as *Mustela uueosule*) is included in the *Corpus Glossary*, the earliest English text written prior to 725 A.D. (Early English Text Society, 1885). Archbishop Ælfric's *Vocabulary* of the 10th century includes "wesel" and "hearma" (Ermine) (Wright, 1884).

.

One of the earliest written prose usages "*Ye wesill overcomys him and slas* [slays] *him"* was by Richard Rolle, the religious mystic of Hampole near Doncaster, in his *Hampole Psalter* (Psalms of David and certain canticles with a translation and expositions in English) written about 1340. Here the term "wesill" is used figuratively as the personification of a predatory malevolent force, evidently with the perceived characteristics of a Weasel, rather than in the sense of an actual Weasel. Whether a knowledge of this animal was derived from imported cultural sources or first-hand field experience is not known, though Gairdner's edition of the Paston letters (III, 365) of 1490, which includes a reference to the practice of rabbit warreners in the parish of Oxenhed, Norfolk, hanging up such "*mysdoers and forfaytours as Wesellis…"* suggests the latter (OED).

Vermin Bounty Payments

By 1566 the "wesell" was regarded as being sufficiently detrimental to agriculture to be included amongst "ravening Byrdes and Vermyn" for which the Elizabethan "Acte for the Preservation of Grayne" allowed parish officials to pay head money for their destruction. Of 157 Yorkshire parishes examined, sets of churchwardens' accounts which contained "vermin" bounty payments were located in the archives of 102 parishes. In these, Weasel bounties, usually at 2d. per head, have been traced in the following eleven parishes, the earliest example being in 1619 in Doncaster: [Numbers of bounty payments are given in parenthesis and dates refer to date runs where Weasel bounties were paid] Adwick le Street 1817-22 (30), Arksey with Bentley 1722-67 (652), Barnburgh 1723-24 (1), Bawtry 1726-32 (17), Bedale 1576-1724 (1), Bolton Percy 1789 (1), Brompton-by-Sawden 1748-1809 (1), Deighton 1665-1825 (1), Doncaster 1619 (1), Great Ayton 1790-93 (2), Hook 1817 (3), Lythe 1704-1804 (1), Market Weighton 1681-1784 (3), Rawcliffe 1721-60 (85), Scarborough 1776 (1), Wensley 1726-1877 (1), Worsborough 1726-27 (4) and Yeadon 1723 (1) (Lovegrove, 2007 & Howes, 2009).

Since different churchwardens were elected annually and, depending on the size of the parish, there could be several wardens operating concurrently, the variations in handwriting

styles and traditions of spelling were enormous. The churchwardens in the parish of Rawcliffe near Goole between 1721 and1760 used at least 15 variations of the term weasel and in the parish of Arksey with Bentley near Doncaster between 1722 and 1767, 25 variations have been identified.

Examination of the first element of the word produces the following forms: we; wea; wee; weo; whe; wi; wo and woo. The final element is even more variable being subject to doubling of the first and final letter and the substitution of s for z or v: sal; sall; sel; sell; sil; ssel; ssell; sle; ssle; zle; zal; zall; zel; zzele; zol and zoll; val; vel; vil; vill. Collectively they conform to forms in Old High German, north and west Frisian, Dutch and Old English, indicating that the term has a considerable etymological antiquity in the Yorkshire region, presumably arriving with immigrant northern European cultures.

Although churchwardens' accounts give evidence from 1619, the earliest published allusions to the existence of Weasel in the Yorkshire region are as late as the 1870s. Clarke *et al.*, (1886) recorded the terms of "mouse-hunter" and '"mouse-weasel" being used in Upper Nidderdale during the 19th century. Alfred Henage Cocks (1878) refers to "ressel" and "rezzele" as vernacular names for the Weasel in the Cleveland area. However, the earliest published record of a specific Yorkshire Weasel was in the report of the Yorkshire Naturalists' Union excursion to Goole and Thorne Waste on 6 August 1877 (Roebuck, 1877).

Discussion

Although it is difficult to believe that the Weasel was not part of the tundra fauna of the Palaeolithic, the woodland-edge and wood-pasture faunas of the Mesolithic and open grassland faunas of the Neolithic, Bronze and Iron Ages, there is currently no substantial evidence to support this. If the Weasel was not part of the Yorkshire fauna prior to Britain becoming an island, one must consider the prospect of its inadvertent or intentional introduction on shipping during historic times. Although it is alluded to in British dictionaries from the 8th century, it is only in 1490 when Norfolk rabbit warreners persecuted "wessels"' as "mysdoers and forfaytours" that they are mentioned in any specific terms. By 1566 they were regarded as being sufficiently detrimental to agriculture to be formally included in the "Acte for the Preservation of Grayne" as a species for which bounties could be paid for their destruction. Surviving records of these bounty payments have provided evidence of Weasels existing in only eleven Yorkshire parishes, the earliest record of a bounty being in 1619. Populations may, however, have been low since Weasel bounties only became a noticeable feature during the 1720s to 1760s. In the context of intra-guild competition, it has been shown that Weasel populations were lower when populations of Polecat *Mustela putorius* were higher. Thus, during the period of the Parliamentary Enclosures when Polecats became particularly vulnerable to persecution, it is likely that Weasels were able to achieve artificially high populations (Howes, 2009).

References

Anon (1989) *Oxford English Dictionary* Oxford University Press, Oxford.

Boylan, P.J. (1981) A new revision of the Pleistocene mammalian fauna of Kirkdale Cave, Yorkshire. *Proceedings of the Yorkshire Geological Society*. 43: 253-280.

Buckland, W. (1823) *Reliquiae Diluvianae*. London.

Chamberlain, A.T. 2002. A gazetteer of non-human vertebrate remains from caves in the Yorkshire Dales described in the scientific literature. *Capra* 4 available at – http://www.shef.ac.uk/~capra/4/bonecavechamberlain.html

Clarke, W.E. and Roebuck, W.D. (1881) *A Handbook of the Vertebrate Fauna of Yorkshire*. Lovell Reeve and Co., London.

Clarke, W.E., Roebuck, W.D. and Storey, W. (1886) Upper Nidderdale and its fauna. *The Naturalist* 11:193-211.
Cocks, A. H. (1878) Provincial names of British animals. *Zoologist* 3rd. series 2 (21): 329-334.
Fraser, F. C. and King, J. E. (1954) Faunal remains. In: Clark, J. G. D. (ed.) *Excavations at Starr Carr*: 70-95. Cambridge University Press, Cambridge.
Howes, C.A. (2009) *Changes in the status and distribution of mammals of the order Carnivora in Yorkshire from 1600*. Unpublished PhD thesis, Universty of Bradford.
Jenkinson, R. D. S. (1984) *Cresswell Crags. Late Pleistocene Sites in the East Midlands*. BAR British Series 122, Oxford.
King, J. E. (1962) Report on animal bones. In Wymer, J. (ed.) *Excavations at the Maglemosian sites at Thatcham, Berkshire, England*. *Proc. Prehistoric Soc.* 28: 255-361.
Lovegrove, R. (2007) *Silent Fields: The long decline of a nation's wildlife*. Oxford University Press, Oxford.
Roebuck, W. D. (1877) News from the societies. *Naturalist* 3: 30-32.
Rutter, J. G. (1956) *The Mammals of Pleistocene and Prehistoric Times* pp. 419-430 in. Wash, G. B. and Rimington F. C. (eds.) *The Natural History of the Scarborough District* Vol. 2. Scarborough Field Naturalists' Society, Scarborough.
Williamson, W. C. (1872) *Description of a Tumulus opened at Gristhorpe, near Scarborough*. 3rd ed. Scarborough.
Wright, T. (1884) *Anglo-Saxon – Old English Vocabulary*. Trubner, London.
Yalden, D. (1999) *The History of British Mammals*. T. & A. D. Poyser, London

---

YNU Biological Records Officer and Administrative Officer

Hannah Droop stepped down from her position as YNU Biological Records Officer and her voluntary role as Membership Officer at the end of July 2012. We are very sorry to see her go and extremely grateful for all the excellent work she has done, but she is leaving for a very good reason – to start a family! We wish Hannah and her husband all the very best with their new arrival. Hannah is still a member of the YNU and we look forward to seeing her and her family at YNU events in future. She worked closely with Section Heads and Recorders to carry out a data audit to find out how many records are held by the YNU, where and how these records are stored and whether the records have been shared with other organisations. Hannah has produced a detailed report of the audit's findings with clear recommendations for improving the accessibility and use of YNU data. The findings of this report will be printed in a future issue of the *The Naturalist*. The Yorkshire & the Humber Ecological Data Trust and the YNU will seek to appoint a new Biological Records Officer later this year to take this important work forward.

We are very pleased to welcome **Claire Neill** to the newly created post of YNU Administrative Officer with immediate effect. Claire will take on the membership and administration work that Hannah carried out, as well as taking on the role of webmaster for the new YNU website (see p160). Some of you met Claire when she volunteered at the York Museum Gardens Bioblitz. She has excellent administrative skills and is a very friendly, helpful and enthusiastic person with a keen interest in natural history. Claire is already a YNU member and is keen to become more involved in the Union's activities – she will be a valuable addition to the team.

Paula Lightfoot

Another early challenge to the 'orthodox' interpretation of industrial melanism in moths, posed by some forgotten observations of Ben Morley in 1911

Geoffrey Fryer

Since I drew attention to forgotten but wide-ranging and highly relevant observations by Porritt (1907) that contradict key elements of the subsequently widely-held 'orthodox', interpretation of the origin, establishment and significance of industrial melanism in moths (Fryer, 2010), I have found a brief mention of observations by another knowledgeable amateur entomologist that do likewise but which are even less likely to be noticed and, more importantly, assessed, than were those of Porritt. These are summarised in a short paragraph of a report by Whittaker and Bayford (1912) on matters discussed at the annual meeting of the Entomological Section of the Yorkshire Naturalists' Union in October 1911. Cited verbatim this reads:-

"Mr Morley read a paper on the 'Reversion of *Polia* [now *Antitype*] *chi* from melanic to type form in the Skelmanthorpe district during the past summer. This phenomenon was attributed to the hot season. All the metamorphoses of the species took place in one or other of the protracted droughts of the summer; and as a consequence imagines appeared fully a month earlier than in 1909 or 1910. Mr. Morley suggested that the reversion was evidence that the melanism of this species was a result of damp and sunless weather, and was not produced by the elimination of light forms by enemies. Mr. Porritt said these observations were fully in accordance with his own experiences, extending over many years. Dr. Corbett suggested rearing the species under dry and damp conditions, and noting the results. A good discussion followed."

Further discussion of these remarkable and informative observations is well merited a century later.

'Mr. Morley' was Ben Morley (1872-1932), a native of Skelmanthorpe near Huddersfield, which lies within the area in which Porritt made important, but for long forgotten, observations on the inception and rapid spread of melanism in many species of moths from about 1880 onward. These events coincided with greatly increased levels of smoke in the atmosphere, derived from the burning of coal and with the consequent blackening of the environment as the area rapidly became industrialised. Morley also made observations on the phenomenon but, apart from the brief precis of what he reported verbally in 1911, his startling findings in this particular case seem not to have been recorded and his report appears to have escaped subsequent notice. While tantalisingly brief, the published synopsis of events makes it perfectly clear that the facts recorded refer to moths encountered in nature and not to reared individuals. Equally clear is that, although in the Skelmanthorpe area melanic individuals predominated in the two preceding generations of the Grey Chi *A. chi*, which is single-brooded, this was not the case in their offspring produced in 1911. The title of his discourse is unambiguous, the key words being "reversion....from melanic to type form." What he recorded is truly remarkable. A generation of melanic individuals, derived, as expected, from a preceding generation of melanics, gave rise to one of non-melanics. While no numerical details were reported in the synopsis of his findings, the clear implication is that the difference was universal. Even if it was only predominantly the case, the facts are still remarkable: a population of moths that was melanic in 1909 and 1910 gave rise, in nature, to

pale offspring in 1911. Moreover this was contrary to the trend that was taking place at that time in moths of several species in the area, where the normal form had been, or was being, largely replaced by melanic individuals.

As a relevant aside it may be noted that the pattern of melanism and the habits of Grey Chi in the Huddersfield area observed by Porritt (1907) were, in any case, difficult to equate with the concept that melanism conferred protective resemblance to the background. In the town and surrounding villages melanic individuals often rested on soot-blackened walls - which was in agreement with the concept - but on adjacent moorland, where they also rested on soot-blackened walls, almost all individuals were "of the palest form" and were readily seen from "a considerable distance".

What might be the explanation of the change observed by Morley? Clearly it was not the result of orthodox mutation, which is a rare event, usually restricted to a very small element of the population. Here something changed the phenotype of the entire population or, though no exceptions were mentioned, of a major component of it, in one cycle of reproduction. Ironically, it has been widely assumed that selection for melanism was taking place in many species of moths in South-west Yorkshire and other smoke-polluted areas at that time, via birds that allegedly preyed selectively on non-melanic individuals that were conspicuous against soot-blackened backgrounds. The abrupt change in Grey Chi was in the 'wrong' direction! It contradicted the usual conception. Morley associated the lack (or loss) of melanism in the 1911 generation of Grey Chi with the high temperatures and low levels of moisture to which the early stages of the moth had been exposed and suggested that the reversion indicated that melanism in this species was "a result of damp and sunless weather" and not of the elimination of non-melanics by predators. The summer of 1911 was the hottest since 1899 and the spring was the hottest since 1893. Since industrial melanism was first noticed (in Manchester) in the Peppered Moth *Biston betularia* in 1848, other than in 1893 only in one year, 1868, were both spring and summer as warm as 1911. (See Bedford (pp 26-29), in Frost (2005) for a clearly portrayed record of two centuries of fluctuations in temperature in the four seasons.) Melanism in moths other than the Peppered Moth began to be noticed in several species in South-west Yorkshire round about 1880 (see Fryer, 2010).

The Grey Chi overwinters as an egg. The larval stages are usually passed through from April to early June, the pupal stage in June and July, and adults are active in August and September. If the cause was, as Morley suggested, a reaction to temperatures that prevailed during the larval and pupal stages, the 'reversal' of the phenotype of Grey Chi in 1911 introduces a new element into the story of industrial melanism (at least in the case of this species) and has a bearing on some of the assumptions involved. As he correctly claimed, it was not in tune with the belief that the spread of the phenomenon, then in progress, was the result of the elimination of non-melanic individuals by predators - essentially birds. Indeed, it flatly contradicts that idea, which he specifically rejected as an explanation. His suggestion was that the loss of the melanism that was a feature of the parents and grandparents of the 1911 year class was the result of the hot, dry conditions experienced by their pre-adult stages.

That some species of Lepidoptera react to climatic conditions by modification of the pattern of pigmentation is suggested by the existence of seasonal forms. The wet- and dry- season forms of some African butterflies are strikingly different, as are the two generations of the European Map *Araschnia levana*. High temperatures are said to restrict the production of melanin and low temperatures to facilitate it, which is in keeping with Morley's interpretation of events in Grey Chi and, indeed, some vanessid butterflies reared at extreme temperatures

conform to such expectations. However, other lepidopterans appear to react to temperature in exactly the opposite way. In three of our native pierid butterflies (the Large, Small, and Green-veined Whites – *Pieris brassicae, P. rapae* and *P. napi*) adults of the second generation, whose early stages have experienced higher temperatures than the first, have more conspicuous areas of melanic pigmentation than those of the first generation. Likewise, in the Holly Blue *Celastrina argiolus*, the black marginal bands of both the fore and hind wings of the female are wider and more extensive in the second than in the first generation. In Map butterflies both sexes of the second brood are so well endowed with melanin as to appear almost black. As Corbett suggested a century ago, rearing experiments using the Grey Chi are desirable. However, whether they can confirm or deny that melanism can be manipulated by differences in temperature and levels of moisture in this species under the conditions that prevail today is questionable - for reasons that are explained in the penultimate paragraph of this note.

As Morley remarked, his observations did not support the idea that melanism had become more widespread in Grey Chi as a result of differential predation by birds on non-melanic, and therefore conspicuous, individuals. On the contrary, they demonstrated a striking change in the opposite direction: what had been a predominantly (or even entirely) melanic population produced non-melanic offspring. Predation was not involved. Particularly remarkable was that the change took place from one generation to the next. The simplest explanation is that a single gene was responsible, as indeed is usually the case where melanism is concerned, and that what Morley observed was the sudden suppression of that gene, or modification of its action. This must have had a trigger and he pointed to a very simple one - high temperatures and dry conditions during the lifetime of the larvae and pupae concerned. This interpretation, while entirely speculative, is not only reasonable but fits the facts.

Such a change from a melanic to a pale form in the Grey Chi, in an area in which melanic forms of several species were replacing the normal forms, also raises serious doubts as to whether melanism *per se* was adaptive. So too does the fact that some of the species that became melanic in the late 19th and early 20th centuries have habits which ensure that they are seldom or never exposed to the attention of birds. Not least of the reasons for doubt was that, in the same area, Morley (1906) had himself witnessed a contemporaneous change in the opposite direction in several species, of which the Water Carpet *Lampropteryx suffumata* provides a well authenticated example. The tendency of several species to become pale suggests that light colour was no drawback, even in soot-blackened areas. The Grey Chi is a good test species. Unlike adult moths of many species that seek concealment by day, it rests fully exposed to potential predators and might therefore be expected to be influenced by whether it is conspicuous or not. It so happens that relevant observations have been made on this species. It was of Grey Chi that Porritt (1907) had already reported that "the palest form" rested openly on soot-blackened walls in moorland areas near Huddersfield, where, not surprisingly, it was conspicuous. Moreover, Harrison (1956), recalling his report of 1920, emphasised that he had for many years had the opportunity to observe the resting habits of this species in north Durham, both the typical and melanic forms of which rested openly, sometimes in large numbers, on walls near his home. Counts made at the beginning and end of the day showed that it was very unusual for even a single individual of either form to disappear during daylight hours. Such observations, which involve moths that have selected their own resting sites, are more informative than experiments in which dead specimens are displayed or, at best, live insects are liberated in situations not of their own choosing.

There is no way in which natural selection could have any role in the situation recorded by Morley. Complete, or near complete, reversal of phenotype from one generation to the next is inexplicable on the grounds of selection on adults - quite apart from the fact that what was claimed to be the adapted phenotype was eliminated! Something caused a dramatic change in the incidence of melanism - in essence its loss - from one generation to the next. It seems reasonable to suppose, as did Morley, that the change was induced by some external factor - in this case high temperature and low moisture content of the environment, or something associated with these factors - on the immature stages of development. This is in keeping with the suggestion that pigment metabolism was influenced by a mutagen introduced into the polluted environments that prevailed in industrial areas at that time (Fryer, 2010). Often the mutagen induced the synthesis of melanin which gave rise to melanic adults but in other cases pigment metabolism was disturbed or inhibited and the result was pale individuals. Interference with pigment metabolism can explain both reactions in the Grey Chi. As Morley in effect suggested, temperature appears to act as the switch which determines whether the mutagen acts in one way or the other. That the phenotype of the moth can change from melanic to pale from one generation to the next clearly demonstrates that, striking as the difference is, a mechanism exists that can direct such a change and that mechanism is presumably relatively simple. It is not generally known that, while many species became melanic at that time, others reacted in a contrary manner and became pale, but both Porritt and Morley were aware of this. In the case of the Grey Chi the direction of change is evidently labile and appears to have been influenced by temperature and perhaps by the moisture content of the environment. This clearly suggests that natural selection via predation by birds was not involved. Indeed, the Grey Chi appears to be virtually free from such predation. As recently argued when Porritt's findings were discussed, the 'orthodox' theory that melanism conferred protection against predatory birds and was, therefore, selected, appears to be an untenable hypothesis. Morley's observations on Grey Chi, like those which showed how some species became paler when the adaptive argument would suggest that this was maladaptive and demanded that they become melanic, and other evidence recently marshalled (see, for example, Fryer, 2010), provide powerful support for the view that the 'orthodox' story of industrial melanism was to a considerable extent a myth. Further strong support for this claim is provided by independent observations reported in the final paragraph of this note.

That a single factor - temperature, can influence the expression of a biological trait is strikingly demonstrated by the temperature-controlled determination of sex in all studied species of crocodilians, in which sex is determined by the temperature at which the egg is incubated. Eggs incubated at high and low temperatures give rise to females; males are produced within a narrow range of intermediate temperatures. Although males and females of multi-cellular organisms differ in many ways, the fact that these profound differences can be effected by a simple physical difference, makes the much simpler change between pigmented and pale moths easier to comprehend. Indeed, in the fruit-fly *Drosophila melanogaster*, the gene *doublesex*, which operates at the end of a pathway which makes different products in the two sexes, selects which pathway will be followed. The mutation *doublesex*$^{M.}$ overrides all other factors and all flies bearing it are males. Compared with such a profound change, the difference between being melanic or pale is trivial - but could conceivably have important ecological consequences! That fundamental attributes can indeed be induced in animals is demonstrated by the example of sex determination in crocodiles and by examples involving even complex changes in structure and behaviour that were cited when Porritt's observations were discussed (Fryer, 2010).

If, as the orthodox interpretation of industrial melanism maintains, matching the background is the key to survival in many moths, melanic and pale forms cannot both be successful under the same environmental circumstances. However, as Morley showed, the fact that Grey Chi could be melanic in one year and pale in the next suggests that matching the background is, in fact, of scant concern, at least in this species. As the Grey Chi rests fully exposed throughout the day, it provides a particularly good demonstration that matching the background is of less importance as protection against predators than is often supposed. Indeed, as Harrison (1956) demonstrated, neither form of this species attracts predators even when exposed in large numbers on self-chosen sites. Moreover, as Porritt (1907) was aware and as can be confirmed by any naturalist who makes the test, if moths that rest fully exposed are found early in the day then they are usually still there at the end of it.

Of two unrecognised, or ignored, problems posed by the classical interpretation of the origin, establishment and spread of industrial melanism in moths, one is - why did so many species become melanic, especially as this often served no obvious purpose? As Porritt (1907) made plain, melanism in species that remain hidden by day is clearly not a device that protects them from predatory birds. So why, when melanic mutants arose in such species, should they be selected for survival any more frequently than very pale individuals? That they increased in incidence with time can hardly be attributed to natural selection. Moreover, some species became melanic so rapidly as to defy explanation on the basis of what is known of mutation rates and the rates of spread of selected traits. Indeed, species that are hidden by day are not subject to any selection in this respect, yet populations of some of them became predominantly melanic within a few generations. The adult life span of these moths is often very short. Whatever selection operates does so very briefly. This difficulty is rendered more acute by the fact that it concerns not just one 'anomalous' species but several.

That melanic forms spread into unpolluted countryside is also completely at odds with the most fundamental element of the basic concept. If melanic individuals of such species rest in exposed situations then such an extension of range effectively negates the argument relating to selection in favour of melanics in soot-begrimed areas. If they are hidden then melanism is no more relevant with respect to predation than it is to a moth hiding in a soot-blackened environment. The spread of melanic individuals into clean countryside simply revealed local movements that are always taking place in some species of these mobile insects but which are not usually apparent, to which melanism was clearly no impediment at that time. Their persistence as recognisable entities would depend on for how many generations the mutagen remained effective in a clean environment. Eventually they disappeared, as they did even in contaminated areas as levels of the postulated mutagen inevitably fell.

Very relevant also is that moths that rest fully exposed and are conspicuous to a human observer, often do so with impunity (see Plate II, centre pages). Very appropriately, the species that is the focus of this note – the Grey Chi - does just that, sometimes in large numbers. Moreover, both the pale and the melanic forms do so. Not only do mixed assemblies of dark and light forms do so but, as Porritt noted more than a century ago, the palest forms sat openly on soot-blackened walls where they were conspicuous to the human observer and, presumably, equally so to potential avian predators. Another anomaly is that, as some species became melanic in soot-blackened areas, others that frequented the same areas became paler, which is difficult to understand if it was advantageous to become melanic. Both the acquisition of melanism, and interference with pigment metabolism which gave rise to pale individuals can, however, be understood if they were alternative reactions to a mutagen present in airborne pollutants. Moreover, the subsequent gradual

disappearance of melanism coincided with reduced levels of the postulated mutagen as pollution declined, whereas soot-blackened walls and other structures persisted for some time after melanism began to decline. Although I have seen no figures for this, I suspect that there is probably a better correlation between the decline of melanism in moths and the advent of clean air - which is mirrored by a reduction of the alleged mutagen - than with the disappearance of darkened backgrounds. Morley's observations on the "reversion of *Polia [Antitype] chi* from melanic to type form" from one season to the next can be accommodated within this interpretation of events. They are completely at odds with the 'classical' concept. However, if a mutagen which was present in the environment when he made his observations was responsible for the situation in which Grey Chi had the potential to be either melanic or pale, it may be that a change in temperature will no longer trigger the change between melanic and pale forms, because the mutagen is no longer present. Ironically, failure to induce a change by this means may provide support for the former existence of a now vanished (or almost vanished) mutagen.

Rupert Barrington has kindly drawn my attention to a paper by Muggins (1956) whose extensive observations strongly suggest that the orthodox story of industrial melanism is a myth. He recorded that around Gravesend *circa* 1900, although "everything was filthy with coal smoke", "melanism was practically unknown." Around Southend, where all was clean, there was little melanism in the early 1930s except in the Peppered Moth that was "perhaps 50% black". However, during the decade prior to 1956 it appeared in many species - he cites 12 examples - and reached a high incidence in some of them. By then the Peppered Moth was predominantly black. Particularly noteworthy is that all the hundreds of Dog's Tooth moth *Lacanobia suasa* that he saw in Gravesend prior to 1914 were non-melanic. However, while dark forms were very rare near Southend prior to 1939, by the mid 1950s it was the light form that had become rare and made up at most 5% of the population. The rest ranged from "medium brown to practically black", about 10% being of the extreme type. Huggins declared that "This moth is my greatest puzzle", noting that the salt marshes in which it lived near Southend "are far from any smoke and by day it hides in the grass...so natural selection appears to play no part in the change". Porritt, of whose observations Huggins was unaware, would not have been surprised. Nor, I suggest, should we.

References

Frost, H.M. (2005) (ed) *The Butterflies of Yorkshire*. Butterfly Conservation Yorkshire.

Fryer, G. (2010) George Taylor Porritt's 19th and early 20th century observations on industrial melanism in moths in South West Yorkshire, and their continuing relevance to a long-running debate. *The Naturalist* 135: 135-172.

Harrison, J.W.H. (1956) Melanism in the Lepidoptera. *Ent. Rec. J. Var.* 68 :172 -181.

Huggins, H.C. (1956) Some aspects of melanism. *Entomologist* 89: 185 -187.

Morley, B. (1906) Notes on lepidopterous variation in the Skelmanthorpe district. *The Naturalist* 31: 48 -51.

Porritt, G.T. (1907) Melanism in Yorkshire Lepidoptera. *Rep. Brit. Ass. Adv. Sci.* 1906: 316-325.

Whittaker, A. and Bayford, E.G. (1912) Yorkshire entomology in 1911. *The Naturalist* 37: 55 - 56.

Letters to the Editors

George Taylor Porritt's 19th and early 20th century observations on industrial melanism in moths in South West Yorkshire, and their continuing relevance to a long-running debate by Geoffrey Fryer

The first half of Geoffrey Fryer's article, in which he ably demonstrates that the traditional (indeed, classic) hypothesis, that bird predation is the driving force in industrial melanism in moths, does not fit the evidence, is an entertaining and informative read. I found it very repetitive in places, though.

However, I cannot agree with his alternative hypothesis, that mutation triggered by industrial pollutants is the cause, as I believe that also fails to fit the evidence. Mutagens damage chromosomes at random. The process of metamorphosis involves the larval body being disassembled and the pieces rearranged into the adult form following instructions from the genome. There must be millions of these instructions, each leading groups of cells to particular loci and guiding their development, but only a handful (perhaps only one) is affected in industrial melanism – the one(s) instructing the proto-melanophores how to deposit melanin in the cuticle. In many cases the melanophores are expanded but occasionally they are contracted, though I suspect that the underlying mechanism is probably the same. You cannot wade into a chromosome with a chemical machete and expect such ordered and repeated results across a range of species.

I suspect that industrial melanism is the result of the phenotype interpreting the genotype in reaction to some external force, and Geoffrey may well be correct in suggesting that industrial pollutants are the cause of individual genes being switched on or off. In my opinion, the evidence does not support the hypothesis that the genome itself is altered by these chemicals. His comments on the development of American moth larvae in response to differences in their foodplants seem to have no bearing on his argument as it is the result of such gene switching in different generations, but it may be a more fruitful line of enquiry.

Bill Ely

Response from the author:

Bill Ely is fully entitled to disagree with my suggestion relating to the possible induction of melanism by mutagens but his arguments are questionable. Mutagens do not "damage chromosomes at random"; they affect genes, usually quite specifically. That adult moths are preceded in ontogeny by larvae and pupae, and that the body has to be "disassembled and the pieces rearranged into the adult", is completely irrelevant to the phenomenon of melanism in the adult, as are the complexities of this process. The genes concerned with melanism in the adult operate at that stage only, just as they do in birds and mammals that lack intermediate stages. The melanin concerned is indeed *deposited*, and darkens the areas where this occurs; the expansion and contraction of melanophores (black chromatophores) is an entirely different phenomenon, seen at its well-known best in chamaeleons and cepalopods, and is *not* involved.
I do not understand what is meant by the statement that one "cannot wade into a chromosome with a chemical machete and expect such ordered and repeated results across a range of species." Melanism arose in many species and, as is known from Porritt's now unrepeatable observations, in some cases certainly did so much more rapidly than can be explained by known mutation rates in uncontaminated environments. I suggested that its induction in many species was caused by a

mutagen. I am not aware that I claimed that "the genome itself is altered" by chemicals in the environment; I suggested only that mutagens may affect a particular gene – in this case the gene for melanism – as they are known to do in other examples. It is suggested that the mutagen was a specific, as yet unidentified, component of the pollution then so prevalent in the environment.

Contrary to the suggestion that observations on the North American moth *Nemoria arizonaria* "seem to have no bearing on" the argument – yet " may be a more fruitful line of enquiry"! - they indisputably demonstrate how striking differences in even larval structure (not just pigmentation) can be *induced* by the kind of food eaten - just as the very different queens and workers of Honey Bees are derived from larvae with exactly the same genetic endowment but whose fates depend on the kind of food on which they are reared.

The recent identification by van't Hof *et al.* (2011) of the location on chromosome 17 of the gene for melanism in the Peppered Moth *Biston betularia* is a step forward but, although this species was the first to display industrial melanism, it is in many ways the odd man out. Some of the other species that became melanic did so much more rapidly – indeed, so rapidly that it is impossible to explain the process by known mutation rates in uncontaminated environments. Moreover, natural selection was clearly *not* involved.

Reference

van't Hof, A.D., Edmonds, N., Dalikova, M., Marek, F. and Saccheri, I.J. (2011) Industrial melanism in British Peppered moths has a singular and recent mutational origin. *Science* 322 : 958 – 960.

Geoffrey Fryer

Wanted!

Large House Spiders from **Tyne & Wear**, south-eastern **Northumberland** and north-eastern **County Durham**.

Can you help with a research project investigating the distributions of species of large House Spider in North East England? These large, brown spiders are mostly seen in August through to October when males run across floors and frequently become trapped in baths and sinks. They have a body length of 1 to 1.5 cm and long legs (see plate VI, centre pages). If you, or a relative or friend live in the regions of interest, and are prepared to capture spiders alive, I'd be extremely grateful.

They should be sent in individual containers (e.g. half a toilet roll tube sealed at the ends) punctured with a few small air holes and containing a scrap of damp, not wet, tissue. Pack the tube(s) in a crushproof container and post to: **Dr Geoff Oxford, Department of Biology (Area 14), University of York, Wentworth Way, Heslington, York YO10 5DD**. Please supply your name and address and for each individual write on its container the date found, the post code it was found at and exactly where it was found e.g. inside a house, garden shed, etc. It may also be possible to identify dead, dried individuals. All material will be acknowledged and postage costs reimbursed. For more information, please email: **geoff.oxford@york.ac.uk.**

A four year study of airborne pollen of Pinaceae in South-east Scotland, 2008 - 2011

Eric Caulton, Gina Angus and **Anna Innman**
Scottish Centre for Pollen Studies, School of Life Sciences, Edinburgh Napier University, Scotland

This four-year study of airborne pine pollen at one site in south-eastern Scotland aims to illustrate the variability of pollen production and to throw light on the factors underlying this.

The study location
The Vogrie pollen trap is located at a height of 176m above sea-level in the author's (E.C.) garden located in the Vogrie Country Park, Midlothian. (Grid Ref. NT 378 642). The Park is an estate of some 104 ha and is the largest Country Park in the Lothians.

This paper is concerned with pine pollen. Eight genera of the family *Pinaceae* occur in the vicinity of the Vogrie pollen monitoring site: *Abies; Cedrus; Larix; Picea; Pinus; Pseudotsuga; Sequoiadendron* and *Tsuga*. The species composition of the trees around a pollen trap is important since airborne pine pollen of different species travels different distances. As an illustration Wodehouse (1945) gave the following distances covered by airborne pine pollen in America: Atlantic Cedar *Cedrus atlantica* 73m; Lebanese Cedar *C. libabi* 42m; Norway Spruce *Picea abies* 40m Douglas Fir *Pseudotsuga menziesii* 182m; Slash Pine *Pinus elliotii* 220m; Pinyon Pine *P. cembroides* var *edulis* 55m. However as no environmental data - terrain or weather – accompanied the information on each species, the value of the distances reported is somewhat limited especially given the large difference between the two *Pinus* species. A recent tree survey revealed that some 33% of pines in the area are Scots Pine *Pinus sylvestris*. As Scots Pine produces abundant pollen, its pollen is heavily represented and recorded on our pollen trap. The fact that this indigenous species is widely planted as an economic crop, accounts for the abundance of its pollen trapped.

Materials and methods
Airborne pollens and spores are trapped using a volumetric spore sampler known as the "Burkard" after its manufacturer. A clock mechanism rotates a drum which carries a sticky tape (Melinex coated thinly with petroleum jelly). The drum is removed at 0900h daily. The portion of tape exposed in the previous 24h is cut away and transferred to a microscope slide. The pollen sample is then stained with a solution of Basic Fuchsin in 50% alcohol and phenolysed Glycerol – Glycerine and covered with a 60mm cover slip. The slide is then read under a Leitz Biomed microscope at x400 magnification. Twelve 4mm wide transects are read across the width of the slide, each transect representing 2 hours of exposure. All pollen types are recorded with the addition of spores of the allergenic fungus *Alternaria*.

The Burkard trap (Fig.1 and Plate III, centre pages) itself is 2.25m above ground level, the trap being reached by means of a step-ladder. Passing air flow is sucked in through an orifice 1x14mm at a rate of 10litres/minute simulating that of normal human breathing. The suction is powered by electricity and the rate of flow checked regularly by means of an air flow meter (Fig.2). Weather data are recorded on site simultaneously with removal of the drum. Rainfall, temperature and relative humidity are recorded. Rainfall is collected through a standard Meteorological Office funnel and the rainwater measured in a calibrated tube. Wind direction is noted from the weather reports throughout the week in the *Scotsman* and *Scotland on Sunday* newspapers. Wind data relate to the Forth Valley, Lothians and Borders

in the south–east of the country. The final total pollen count for each day is converted to pollen grains/m^3 air using a coefficient particular to the microscope. These data, together with those relating to weather, are faxed by 10.30h each morning to the Meteorological Observatory at Eskdalemuir, Langholm, Borders, about 80 km to the south of Vogrie.

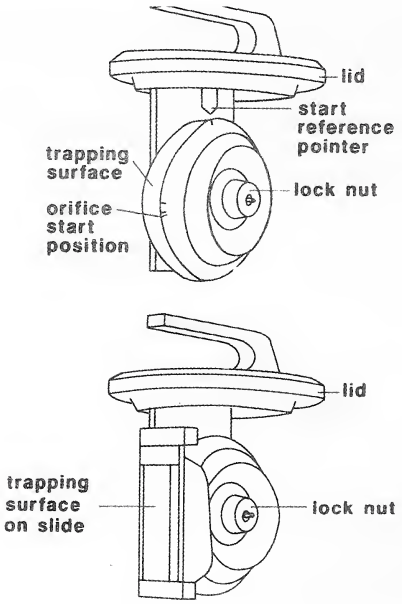


Figure 1. Diagram of a Burkard trap in (top) operating and (bottom) access positions

Figure 2. Diagram of the air flow meter used.

At the end of the trapping period, pollen and weather data are compiled graphically which enables correlations between the pollen spectra and weather data to be made. Wind direction is recorded on a daily basis from maps in the weather reports published in the above newspapers. Wind direction is noted on a series of columns – eight corresponding to the cardinal points of the compass. At the end of each month the number of days in which the wind blew in any one direction, is totalled and converted to a percentage of the number of days recorded. The data are graphically represented in the form of a 'Wind Rose'. This is constructed by points on a series of circles: 10%, 20%, 30%, 40% and 50%. The points on the circles are then joined up to form a wind rose. Wind roses were constructed for each year's season (Fig.3).

The length of the pine pollen season at Vogrie is calculated from the number of days of monitoring from beginning to end of counting pollen grains. From the total number of pollen grains counted, 2.5% are deducted at both ends of the pollen period. The two dates on which the 2.5% numbers occur are noted and represent the start and finish of the season.

The Diurnal Periodicity, that is the time of day that pollen is released and recorded, is graphically represented in histogram form. The numbers of pollen grains (either total or converted) for each of the twelve transects comprise the data for the histogram.
The pollen count is classified for publicity purposes in the following categories:

Less than 30pgs/m^3 air = LOW
Between 31 and 49 = MODERATE
Between 50 and 149 = HIGH
And above 150 = VERY HIGH

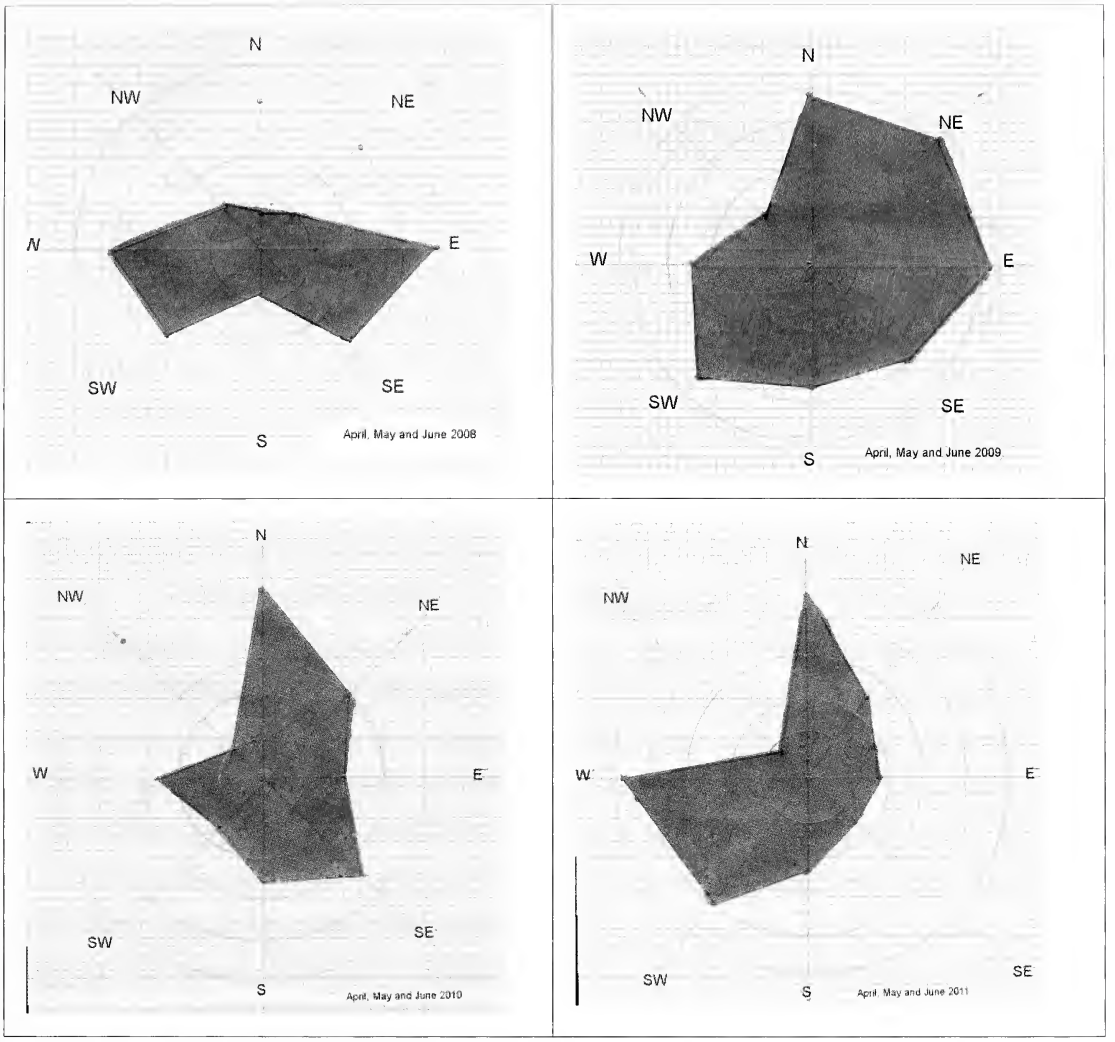


Figure 3. Wind roses for the months of April, May and June for the years 2008 (top left), 2009 (top right), 2010 (bottom left) and 2011 (bottom right).

A ten-year study (1988 -1997) of the pollen spectra recorded at the Burkard's former rooftop site in Edinburgh was produced and printed as an A5 leaflet (Caulton, 1997). This was designed to be of use to residents and visiting tourists to Scotland, as the spectrum for each of the taxa figured was colour-coded for the degree of allergenicity (see Plate III, centre pages).

Pine pollen count 2008 (Graphs of pollen counts 2008-2011 are shown in Fig.4 p105) Recording during 2008 lasted 41 days (17/05–26/06 incl.)The pollen season began on 20th May and ended 18th June, 29 days. The pollen count (pgs/m^3 air) reached one major and three minor peaks.The major peak occurred on 4th June and fell into the HIGH category. Between 30th and 9th June three minor peaks came within the MODERATE category. From 12th June onwards counts were LOW. Between 20th May and 19th June 186 mms of rain fell (mean 6mm/day). The highest rainfall occurred on 14th June and 30th May, 45mm and 33mm respectively. These two peaks coincided with troughs in the pollen count. Three lesser peaks

of rain occurred on 1st, 2nd and 18th June, all in the 20mm range. Again these peaks coincided with very low pollen counts.

During 2008 season the highest pollen output occurred between 0900 and 1500h. Thereafter output declined until 0700h after which there was a small peak of 18pgs/m^3 air. The maximum output occurred early afternoon, 1300-1500h and registered 116pgs/m^3 air. In 2008, the wind rose displayed a marked east-west axis with east wind being marginally dominant.

Pine pollen count 2009

Recording Pinaceae pollen during 2009 extended over 78 days (18/04-04/07). The pollen season began on 29th April and ended on 22nd June, 55 days. The pollen count (pgs/m^3air) showed one major peak on 29th May, the latter attaining 120 HIGH. Three minor peaks were all MODERATE: From 4th June onwards the counts were LOW.

Generally speaking the rainfall was low with only two peaks: June 14th (27mm) and June 10th (12mm). The remaining volumes were all below 5mm, with 21 dry days. As with 2008 the major pollen count peaks coincided with troughs in rainfall. The minor rainfall peaks all coincide with declines in the pollen count curves. The two major pollen peaks of 23rd, 29-30th June coincide with zero rainfall.

Compared with 2008 when maximum daily pollen release to the air occurred between 1300 – 1500h, 2009 showed a gradual increase over five hours attaining maximum output between 1300 and 1500h, after which there was a relatively sharp decline in output. The maximum number of pollen grains was 143pgs/m^3air, a figure considerably higher than the previous year's maximum. The wind rose for 2009 showed a distinctly NE-SW axis with a marked broad band E-S, the latter having similar percentages for E and SW. Much less wind coming from N and NW was recorded during the 2009 pine pollen season.

Pine pollen count 2010

Recording began on 5th May and continued until 18th July, a total of 74 days. The pollen season lasted 49 days (18th May–5th July). Total pollen recorded as pgs/m^3air demonstrated three major peaks on 27th May, 31st May and 4th June and one minor on 11th June. Total pollen counts outside of the four peak pollen counts were LOW. Rainfall was low, coinciding with the peaks with the higher volume of rain (17mm) on the three days of June. Maximum and minimum temperatures correlated well with both rainfall and total pollen count.

Diurnal Periodicity peaked during 1700 and 1900h, ascending steeply between 0900 and 1700h and declining erratically from the peak. The wind rose for 2010, in common with 2008, 2009 and 2011 showed a distinct W-E direction. Unlike the other three years, however, there was a dominant northerly direction (predominantly in the first week of May and the first half of June).

Pine pollen count 2011

The overall sampling period lasted 63 days (16th Apr – 17th June inclusive). The pine pollen season lasted 24 days (3rd May – 26th May). The pollen count showed four peaks of over 100pgs/m^3 air; with the highest at 160 pgs/m^3 air on 9th May. From 16th April – 30th April counts were very low as they were from 28th May onwards. Rainfall during the sampling period recorded two peaks 7th May and 8th May, 16mm and 10mm respectively. A minor peak of 7.5mm was recorded on 23rd May. The pollen count was HIGH on 7th and VERY HIGH on

9th May - 147 and 160 pgs/m^3 air which coincided in both cases with an immediate pollen release within 24 hrs. of rainfall. The two lower peaks of pollen occurred on 4th and 18th May, 106 and 102 pg/m^3 air respectively and coincided in both cases with zero and 0.09mm rainfall. Maximum temperatures during the first half of May were the highest in the month declining from 18^{0}C to 12^{0}C, the highest temperatures coinciding with the two major pollen peaks of 6th and 8th May.

The Diurnal Periodicity in 2011, peaked early between 0900 and 1100h. Between 1700 and 1900h pollen output declined step by step to 60 pg/m^3 air, which is still in the HIGH range. One minor peak (52 pgs/m^3 air) occurred between 0300 – 0500h. Before and after this period counts were plus or minus 30pgs/m^3 air of the peak.

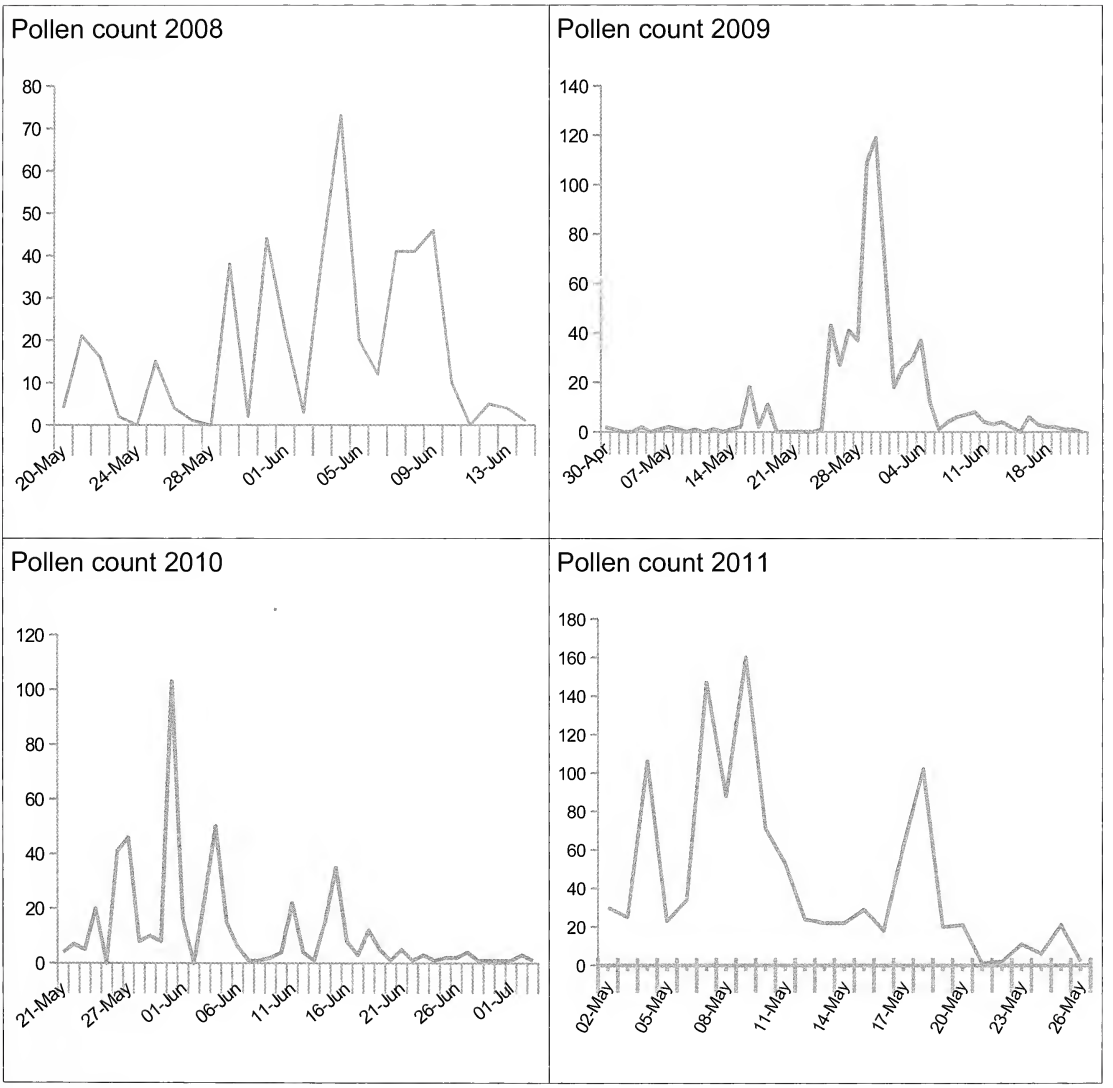


Figure 4. Graphs of pollen counts 2008-2011. The counts (y-axis) are in pollen grain numbers per cubic metre of air sampled (pgs/m^3 air).

Conclusions

Two markedly different weather patterns obtained in 2008/09 and 2010/11.The former two years experienced no 'normal' winter conditions with relatively mild temperatures, varied rainfall and relative humidity hovering around the 75% level. The latter two years, by way of contrast, produced severe winter conditions extending over 3-4 months. Snow and ice prevailed with lower relative humidity and much sunshine.

In all four years of the study pine pollen season length (calculated at 2.5% level) was similar but there were differences in timing. In 2008, 2009 and 2010 the seasons occurred about the same time – late May to mid-June. The 2011 season was much earlier than the previous ones and held throughout May.

Wind roses compiled for each of the four seasons all displayed a markedly SW direction, although, during the two latter seasons, strong northerly (NW-N-NE) winds occurred. Wind roses for 2008 and 2009 seasons showed predominantly E-W directions.

The pollen count for each season showed marked variation reflecting dry and wet periods, where correlation between peaks of pollen and troughs of rainfall and vice versa, were well demonstrated. Maximum temperatures were also seen to be correlated, though weakly, with rainfall and pollen count.

Diurnal periodicity for each season showed variation in pollen production throughout the twelve 2-hour daily transects. The highest pollen release occurred in the first eight hours 0900 -1500 in 2011, following on the heels of the most prolonged cold spell of the four years. The diurnal periodicity characteristics of 2008, 2009 and 2010 showed much reduced pollen release in all periods In each of these years pollen release was highest during the first six-eight hours of the day. All four figures showed sharp decline from 1900h onwards. The increase in pollen release began between 0700 and 0900 on the following day.

The study has clearly shown a distinct and consistent pattern over the relatively short season of pollen release – this is particularly relevant to the major pollen component of the four-year study, Scots pine (*Pinus sylvestris)*.

References

Caulton, E. (1997) *Calendar of allergic pollens in Scotland, 1988-1997*, Scottish Centre for Pollution Studies, Napier University, Edinburgh, A5 sheet.

Wodehouse, R. P. (1945) *Hayfever plants, their distribution, time of flowering, and their role in hayfever, with special reference to North America*, The Chronica Botanica Co, Waltham Mass, pp245.

Queen's Birthday Honours Award for YNU member

The Queen's Birthday Honours list published on 16 June 2012 included the award of the British Empire Medal to Dr. John R. Mather for long term services to ornithology and conservation. The Editors and all YNU members wish to congratulate John on this well merited award.

What is a naturalist?

Dr John R. Mather

The study of natural history embraces many disciplines within geology, botany and zoology but just what is a naturalist? Since the earliest times, the term has been applied to very different groups of people whose developing attitudes towards the countryside have changed dramatically. It was once a widely held view that those interested in nature and eagerly cycling along country lanes wielding nets to sweep up insects or creeping around hedgebacks in search of plants or birds, were somewhat peculiar, perhaps still are.

In the 18th and 19th centuries, natural history pursuits were predominantly male pursuits and the province of the gentry, gentlemen farmers, schoolmasters and the clergy, and those who took an active interest in the countryside and the animals and plants to be found therein were automatically deemed to be naturalists. For those engaged in any one of the different disciplines, the ongoing and end result of their pursuits was invariably a collection of specimens, as is still the case for some today. The entomologists had drawers full of pinned butterflies, moths, flies and beetles, the botanists had their vascula and herbaria and the ornithologists had collections of eggs and cases of stuffed birds which were all too readily supplied by the gunners and taxidermists of the period.

Although the gun was the main accessory for every zoologist at least up to the early 20th century, there were some who looked on the things they shot as more than just another rare or unusual bird or mammal destined to grace the hall of some mansion. One such visionary was Gilbert White, born at Selborne in Hampshire in July 1720 and who died there in 1793. Things have come a long way since those early pioneering days when species with which we are now very familiar were just being discovered and described. White was one of the first to realise that there were three species of *Phylloscopus* warblers in his parish and in a letter to Thomas Pennant, dated 4th August 1767 wrote:

> "A little yellow bird still continues to make a sibilant shivering noise in the tops of tall woods. I perceive there are more than one species of the *Motacilla trochilus (Motacilla* was the original generic name for the *Phylloscopus* warblers). Mr Derham supposes, in Ray's Philos. letters, that he has discovered three. In these three is again an instance of some very common birds that have, as yet, no English names."

White was still intrigued by the 'three' warblers in 1768 and wrote again to Pennant on 18th April:

> "I make no doubt but there are three species of Willow-wrens; two I know perfectly; but have not been able yet to procure the third. No two birds can differ more in their notes, and that constantly, than those two that I am acquainted with; for the one has a joyous, easy laughing note; the other a harsh loud chirp. The former is every way larger, and three quarters of an inch longer, and weighs two drams and a half; while the latter weighs but two; so the songster is one-fifth heavier than the chirper, the chirper being the first summer bird of passage that is heard beginning his two notes in the middle of March, and continues then through the spring and summer till the end of August.The legs of the larger of these two are flesh coloured; of the less, black."

He was, of course, referring to the Wood Warbler, the Willow Warbler and the Chiffchaff, all of which can be recognized as such from his very careful observations. There were problems

with identification then as there are sometimes today and on 4th August, 1767, White wrote again to Pennant:

> "I suspect much there may be two species of Water Rats. Ray says, and Linnaeus after him, that the Water Rat is web-footed behind. Now I have discovered a rat on the banks of our little stream that is not web-footed, and yet is an excellent swimmer and diver. It answers exactly to *Mus amphibius* of Linnaeus. I shall be glad to procure one: *plantis palmatis."*

White was misled by Linnaeus as there is only one species of Water Rat (Vole) and the hind feet are not webbed but fringed with hairs.

To give some idea of the approach to natural history in the spacious days of the 18th and 19th centuries, I can do no better than to quote from a lavish tome entitled *Notes on Sport and Ornithology* written by His Imperial and Royal Highness, the late Crown Prince Rudolph of Austria in 1889, wherein he describes in very colourful prose his experiences on hunting expeditions. The first part, written in diary form, chronicles a hunting trip to the Lower Danube in 1878:

> "This was not the first time that I had thought of exploring these beautiful tracks of countryside so little known to travellers and of rambling through them, gun in hand, studying their ornithology."

He assembled four other "sportsmen" including his brother-in-law Prince Leopold, of whom he said:

> "I was much bent on having him with us on this trip; for being as he was, a capital shot and a thorough sportsman from top to toe, such as one now but seldom meets with."

The party set off for Pest on 22nd April, 1878, to join a specially hired steamer for the two-week journey down river. The main purpose of the expedition was to collect birds and dire was the slaughter committed amongst them. They made daily excursions ashore and some entries in the diary are lurid in their detail and set the scene:

> "Close to the bank of the river, a Cuckoo fluttered up into a fruit tree, calling loudly, and I shot it for the sake of the measurements."
>
> "I noticed a White Stork standing bolt upright on one leg a long way off. As this bird has now become rather rare in other parts of the Empire, and I had never shot it, I determined to try and approach it in the carriage, a manoeuvre which succeeded fairly well, for it allowed us to come remarkably near. My jaeger (hunter) however, persuaded me to fire a risky shot before we had got within really good range of it, and the poor bird flew over the river to the Hungarian plains only slightly wounded."
>
> "I found a Black Stork's nest on an old oak but I could see only the red bill protruding over the edge of the nest. As the bird was most confiding and would not leave its abode, I fired my first barrel at the long bill and unfortunately with too good an aim, for it hung down broken, and the bird, quite disfigured and bewildered flew straight over my head, the second barrel bringing it to the ground."

The main interest was birds of prey and the slaughter inflicted by the party is hard to imagine, but these were sportsmen/naturalists acting in the supposed interests of ornithology. The following accounts of experiences at the nests of Imperial Eagles paint a vivid picture of the carnage:

"....I now sent my attendant away and crouched down near the nest, hidden by the stem of the tree; but hardly had I loaded the gun when I saw a large shadow on the ground and looking up as well as the glare of the sun would allow me, I noticed the great form of an eagle as it landed in the tree. I jumped up, holding my gun ready, and got close under the nest in a few strides. The eagle heard me and flew out of its abode on the side furthest away from me; but the first shot which I fired hit it hard and the second brought it down to the ground with a broken wing and sent it rolling down the slope, I soon got up with it but there was still plenty of life in the bird; so, not wishing to damage its plumage by a shot at close quarters, I tried to finish it with a knife but it kept me off by striking out in all directions with beak and claws. I then cut a strong stick, but on approaching the eagle with this it darted towards me full of fight; so I called up my attendants and it was only by the united efforts of three persons that the bird was at last suffocated. It was not a Stein (Golden Eagle) as I had confidently expected but a very finely marked Imperial Eagle."

At another Imperial Eagle's nest:

"...I fired and, wounded by the first shot, the eagle sank towards the bushes, the second barrel bringing it down to the ground. Greatly delighted, I hurried up to my splendid booty, which Hodeck at once carried off to the cart, while I remained in my ambush to await the coming of the male."

Having shot the male Imperial Eagle at yet another nest, Prince Rudolph goes on to say:

"I therefore crept under the nest to wait for the return of the uninjured female. Below me was a beautiful woodland glade where Cuckoos were flying up and down, and the most charming songs from the merry throats of many birds were wafting up from the valley."

What a contrast in attitudes, but shooting to collect specimens was an accepted practice. The list of birds collected during the expedition makes dismal reading:

Black Vulture	8	Goshawk	5
Griffon Vulture	1	Hobby	1
Imperial Eagle	7	Kestrel	4
Spotted Eagle	3	Marsh Harrier	1
Booted Eagle	2	Eagle Owl	2
Sea Eagle	14	Tawny Owl	1
Osprey	2	Black Stork	11
Short-toed Eagle	1	Grey Heron	9
Common Buzzard	3	Purple Heron	2
Red Kite	1	Night Heron	1
Black Kite	9	Cormorant	8

What raptorial riches these vast woodlands, marshes and plains must have held at that time. In addition were 45 other specimens including Greylag Goose, Nightjar, Roller, Turtle Dove, Rock Thrush and Hooded Crow.

In the early 20th century, one experienced ornithologist was J.K. Stanford who, in 1912, visited Spurn Peninsula and stayed at the Crown and Anchor Inn at Kilnsea. World-famous naturalists had collected there in their time and Stanford recounts:

"...and Claude Ticehurst, having persuaded me to do the trip dilated to me beforehand on the historic four-wheel cab in which 'all the best ornithologists' from Howard Saunders onwards had done the nine miles from Patrington to the inn at Kilnsea. Alas,

this vehicle when I arrived was no more. Spurn had long been a favourite hunting ground in the autumn migration for Harry Witherby (where his wife was said to do all the skinning of birds for him), but that year he had gone to Holy Isle."

Following his time at Spurn, Stanford wrote:

"I met with beginner's luck in the manner of rarities, so much so that Harry Witherby wrote to me later; 'It is an old and favourite ground of mine as you know, but I never had anything like such luck as has befallen to your lot.' The first bird was a Ruff, given to me by T.A, Coward who happened to be staying at the inn. I remember our struggles to skin it. Like so many autumn migrants it was excessively fat and the fat, melting in the heat of the oil lamp, filled me with a dislike of skinning which I have never since lost. Next day I secured a Barred Warbler and shall not forget my anguish when Coward, who should have known better, insisted it was only a Garden Warbler. I saw another which I shot a few days later."

To serious students of ornithology those famous names will stir the blood.

Things changed but little during the ensuing years; even during the first half of the 20th century birds were being shot in the cause of science and game-keepers too were still mercilessly keeping birds of prey in check in the interests of the grouse and pheasant shooting fraternities.

Natural History Societies were becoming established during the 19th century and most cities and towns had such. The great county of Yorkshire had several local societies and, in 1861, these were amalgamated to form the Yorkshire Naturalists' Union which today has 44 affiliated societies. In those seemingly far-off days, members with a keen interest in the countryside and its denizens were true naturalists who, clad in camphor-laden tweeds, would assemble in dimly lit rooms to exchange specimens and experiences. The Harrogate and District Naturalists' Society was formed in 1947 and, on 14th November, 1951, I became a member of a serious and specialized band of enthusiasts. I recall our meetings upstairs in Crescent Road, Harrogate, where perhaps only a handful of members would assemble and gaze at strange, wriggling creatures through microscopes. At other times we would be treated to a lantern slide talk when one of the members or a visiting speaker would bring large hand-coloured glass slides which were slotted into a strange, black machine with an ornate roof and a chimney, somewhat reminiscent of a wood-burning stove, and illuminated by what seemed like half a dozen glow-worms in a jam jar! But these were the beginnings and every society went through an incubation period, some failing to hatch and subsequently disbanding.

During the 1960s and '70s, the Harrogate Naturalists' Society had several very active and knowledgeable naturalists: botanists included Dorothy Haythornthwaite, W.H. Jowsey, Til Mellard, Elsa Unné and Olive Windermer; entomologists were W. Beck, D. Jesper, C.I. Rutherford, D.R. Trenbath and A.E. Winter; ornithology was represented by the Rev. K. Ilderton, Christine Shaddick, A.F.G. Walker, myself and others.

Social life was now changing; five-day working weeks were commonplace, many were retiring early and suddenly people had more leisure time on their hands. Those with an interest in outdoor pursuits took to the countryside in great numbers and here was a reservoir of potential membership for various organizations and societies. Some, answering to the quaint title of 'ramblers' who fought for the right to roam wherever they chose, set forth armed with thin black sticks and suitably laminated maps of the world strung around their

necks, banging against chests starved of oxygen as they struggled up some formidable incline harbouring thoughts of the next village pub, seeing nothing but the well-dubbined toes of their boots and completely oblivious of the songs, chirps and flutterings of the nearby creatures which were trying in vain to attract their attention.

Many others elected to pull a trolley full of strange implements around acres of well manicured grass in pursuit of a small white ball which they purposefully propelled into the wide blue yonder, only to go in search of it and repeat the performance in the belief that the effort may enhance their standing in the clubhouse, particularly if they went on to regularly lose the ball down a succession of small holes. The Rabbits, Grey Squirrels, Green Woodpeckers and Jays which also enjoy the green carpet, offered stimulus to some who developed an interest in nature.

Others, having been brainwashed by a never-ending stream of natural history programmes on television, decided that this was the life for them. Not surprisingly, it was our feathered friends that attracted most hopefuls, being by far the easiest and most exciting of all the disciplines to pursue. Having joined that proliferating body of *Homo ornithologicus,* there were several avenues along which one could venture; go it alone and be forever frustrated and often misguided by the seemingly endless array of small, insignificant birds whose appearance resembled nothing in the field guides, or join a society or bird club, which many did, in the hope of meeting like-minded devotees who would, hopefully, explain how to identify this or that bird, mammal, plant, insect or fungus. Whatever route was chosen, a perceived necessity to be suitably equipped and clad would send the eager recruits, particularly the birders, dashing to the bookshops, camera and optical retailers and the clothing stores where the necessary items would be purchased, in the belief that without the latest and most expensive accessories, successful bird identification would somehow elude them. There was little problem being kitted out as the pursuit of birds had, by now, spawned a multi-million pound industry embracing books, binoculars, telescopes, cameras, clothing and holidays.

With the passing years, came the accelerating advancement of technology which, by the end of the 20th century, offered very different alternatives for those who were wandering about in search of birds. The ability to phone an information line and be told just what had been seen and where, sent the caller scurrying off in hopeful pursuit. Alternatively, one could invest in the latest technological gadget and buy something called a 'pager' which, at the press of a button, indicated exactly what had been seen just a few minutes before and how to get to it. This facility was considered a must for some and removed the need to spend uncomfortable hours in the damp, windswept countryside in search of rare birds and allowed one to sit in the comfort of home and wait for some other poor soul, who <u>had</u> ventured into the damp and windswept countryside, to inform the armchair birder of some exciting find, thus providing the excuse to quit the sofa and speed off to the indicated place before the object of scrutiny decided to hop it. These 'twitchers' cannot, in the remotest sense of the word, be called naturalists.

For those of us who had graduated from boyhood in the countryside and spent a lifetime in contact with nature in all its forms, having climbed trees and cliffs for nests, waded waist deep in methane-draped marshes in search of young gulls to ring and had, during the process, acquired a working knowledge of most of the 'other orders', this new band of single-minded birders was something to be regarded with suspicion. They had better optics, bigger cameras and expensive waxed jackets but knew little about ornithology. Some of us 'oldies' were still clad in Army and Navy Stores boots and duffle coats, with ancient binoculars

sometimes suspended with red binder twine known fondly as 'optical string' and had to lie on our backs propping a three feet long Broadhurst and Clarkson four-draw brass telescope, weighing what felt like half-a-ton, on one raised leg - an activity which was enough to steer all but the keenest birder towards philately.

However, it soon became apparent that these eager, but innocent, souls were turning to us for help. During a visit to the Fame Islands, I was approached by a couple armed with cameras, binoculars and a huge telescope to be asked If I was an expert on birds, to which I had, modestly, to admit. "What are those six ducks sitting on that seaweed-covered rock?" they asked. "Female Eider Ducks", I replied. With great surprise, the fellow turned to his wife and said "Eider Ducks dear, not Garganeys". I remembered that I had arranged to meet someone and left! This is a common scenario but at least the interest is there and needs to be encouraged.

The attitudes and behavioural traits of the field naturalists, birders in particular, have evolved far quicker than could ever have been imagined. In such a relatively short time span, the art of photography, for instance, having gone from the Kearton brothers at the end of the 19th century, hollowing out a stuffed ox in which to conceal themselves in order to photograph a Sky Lark at its nest with a huge plate camera, the lens of which protruded through a hole in the beast's chest, to digiscoping, the intricacies and technical wonder of which defies belief.

So, what then is a naturalist?

Broadly speaking, someone who takes an interest in the plants and animals to be found in the countryside and whose degree of involvement ranges from simply enjoying what they see to specializing in a particular discipline and recording their finds, whilst some study a particular patch and have regard for all its various life forms. There are several organizations, notably the Botanical Society of the British Isles, Butterfly Conservation, the British Dragonfly Society, the Royal Society for the Protection of Birds and the British Trust for Ornithology, who keep a watching brief on our fragile environment and who rely on such people for support. They pull together teams of enthusiasts from a vast reservoir of mature volunteers who undertake survey work on their behalf, and these stalwarts certainly qualify for the title; by far the largest amount of survey work in this country is carried out by such volunteers.

Simply being a member of some natural history society or bird club is enough for some and their enjoyment comes from occasional field trips and regular attendance at indoor meetings to mix with friends and listen to some visiting speaker regale them with obscure aspects of the natural world of which they were completely unaware, or be transported to some exotic land, if only on celluloid, and latterly through some strange and sometimes temperamental digital equipment, followed by tea or coffee.

For many, that's all they want - and why not!

References:

Crown Prince Rudolph of Austria. (1889) *Notes on Sport and Ornithology* Translated by C.G. Danford. Gurney and Jackson, London,

Kearton R. (l902) *The Natural History of Selborne by Gilbert White.* Cassell and Company Ltd, London.

Stanford J.K. (l954) A *Bewilderment of Birds.* Rupert Hart-Davis. London.

Nesting Kittiwakes on Scarborough Castle Headland and South Bay

Robin N. Hopper 10A, Ramshill Road, Scarborough, YO11 2QE.

History

The Kittiwake *Rissa tridactyla* is known to have nested on Scarborough Castle Headland for many years, with a frequently used road and walkway between their nesting site and the sea on which they feed. The almost vertical cliffs of eroded layers of calcareous grit that form the the Headland produce many suitable ledges on which their precarious nests can be built. There is no mention of any Kittiwakes breeding there by Nelson (1907) but Chislett (1952) mentions the late W.J.Clarke recording a pair nesting in 1940 and that "a pleasantly situated little colony has resulted which is somewhat unusual in that a frequented road runs between the cliff and the sea". Wallis (1953) recorded between 30 and 40 nests in 1948 but also stated that it was not possible to say in which year breeding commenced because of military restrictions. Mather (1986) records that there were 650 pairs in 1966, 1,250 pairs in 1967, 1,349 in 1968, 1,712 in 1974, 2,800 pairs in 1975 and 1600 pairs in 1980. The 1975 count seems high and may represent bird numbers rather than nests (i.e. two birds per nest). This article describes the colony status for the last 25 years (1987-2011).

Method

I undertook the task of counting the colony annually at the height of the breeding season in June, having had previous experience of count studies of waders on the Dee estuary and Rooks in Suffolk. The nests were counted using binoculars, first in one direction and then in the reverse direction . This produced a difference of between 1% and 5% and the average of the two counts was taken. If the difference was greater than 5%, the count was repeated. In 2003 and 2004 the count was not possible because of major sea defence work being undertaken by Scarborough Borough Council which limited pedestrian access to close to the 2 metre high protective wall at the cliff base, preventing convenient viewing of the colony.

Initially the counts (Table 1) extended from the 'Toll House' immediately north of the harbour to the 'Coffee Pot Rock' in the North Bay, that being the northern extent of suitable cliff-nesting habitat. Subsequently, from the mid-1990s, birds began to extend their range into the harbour and South Bay area, nesting on ledges on suitable buildings, and these were included in the count. This may have been the result of safety work on some parts of the Castle Headland where wire mesh was deployed over the cliff face to prevent rock falls from causing injury to the public below. The presence of the nesting birds on the window ledges of some of Scarborough's iconic buildings (Grand Hotel, Royal Hotel and Town Hall) has not proved popular. Currently, there are approximately 250 nests away from the main cliff-nesting area.

Discussion

From 1987 to 1996 the average size of the colony was 1397 nests. Post 1996, the last 10 counted years to 2011 have produced an average colony size of 1750, an increase of 25% (Fig.1). Expansion would appear to be related to the birds' willingness to move onto buildings, as most of the suitable cliff sites appear to be occupied. The overall trend is of a gradual increase and, if sites in town are eliminated by protective control measures (wire netting and spikes), it will be interesting to see if the trend continues and cliffs to the north of Scarborough (e.g. Cloughton Wyke) become occupied.

In 2004, a pair of Peregrine Falcons nested almost in the centre of the colony and have succeeded in doing so every season since. Although they have been observed taking Kittiwakes for prey, this seems to have had little or no effect on colony numbers. It could be postulated that the Peregrines have repelled Foxes or other predators, thereby having a relatively protective effect on the colony.

Table 1. Nest counts from 1987 to the present.

Year	Number	Comment
1987	1564	
1988	1210	
1989	1322	
1990	1511	
1991	1308	
1992	1384	
1993	1304	
1994	1311	
1995	1414	
1996	1457	
1997	1853	
1998	1405	
1999	1801	
2000	2060	
2001	1851	
2002	1832	
2003	No count	Sea defence work
2004	No count	Sea defence work. Peregrine
2005	1449	Peregrine
2006	1565	Peregrine
2007	1479	Peregrine
2008	1627	Peregrine
2009	1596	Peregrine
2010	2011	Peregrine
2011	2031	Peregrine

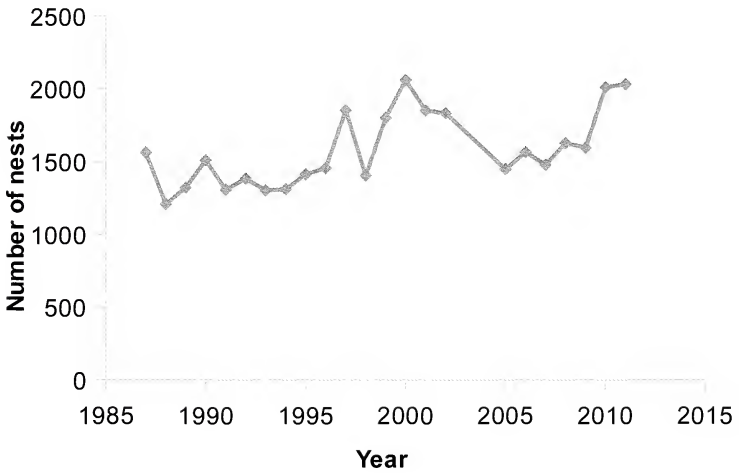


Figure 1. Graph of nest counts between 1987 and 2011 (no counts in 2003 and 2004).

Acknowledgements
Thanks to Steve Wignill for taking over the task for 2010/11 and the future and to Dr. Ian Glaves for preparing the manuscript.

References
Chislett, R. (1952) *Yorkshire Birds* pp 297-8. A.Brown & Sons Ltd., Hull.
Mather, J.R. (1986) *The Birds of Yorkshire* pp 347-50. Croom Helm. ISBN 0-7099-3510-2.
Nelson, T.H. (1907). *The Birds of Yorkshire* Vol.II pp 689-693. A.Brown & Sons, London.
Wallis, A.J. (1953) in Walsh, Rimington *et al. The Natural History of the Scarborough District* Vol II p 402. G.A.Pindar & Son, Scarborough.

Importance of wetland management and restoration for farmland bird biodiversity: case study of Cayton and Flixton Carrs Wetland Project

Agne Gvozdevaite
email: agnegvozdevaite@yahoo.co.uk

Introduction
Habitat loss and degradation have resulted in severe declines of grassland-breeding waders throughout Europe during recent decades (Wilson *et al.*, 2005). Fuller *et al.* (1995) showed that 24 of 28 species of farmland bird had experienced decreases of population in Britain between 1970 and 1990. This progressive pattern of decline applies not only to birds but to many other farmland taxa such as insects and flowers (Robinson and Sutherland, 2002, Siriwardena *et al.*, 1998) These changes in bird populations have mostly been linked with the increased intensity of agricultural management over the last 50 years (Vickery *et al.*, 2001). The switch to intensively managed improved grassland is likely to have reduced both the area and the suitability of habitats for birds, as improved grassland is usually an unsuitable breeding habitat for waders. In the longer term unimproved grassland is also under threat from climate change (Hulme, 2005), increasing sea-levels and increased frequency of spring flooding and/or droughts. (Nicholls *et al.*, 1999). Currently, there are two mechanisms which can potentially conserve grassland breeding wader populations: nature reserves and Environmental Stewardship (ES) schemes. Of course neither mechanism is useful against the longer term problems of climate change or rising sea-levels. ES schemes are some of the main agri-environment schemes functioning on wet grassland in England. They are intended to maintain and enhance the landscape, biodiversity and historic value of designated habitats. They operate by offering subsidies to farmers who enter a range of land-management schemes, arranged in 'tier options' (Ovenden *et al.,* 1998). Low tier options preserve the existing value, largely through preventing further agricultural intensification, while high tier options aim to improve the biodiversity of the land.

Wetland creation and restoration in the wider countryside
Lowland wet grassland in Britain supports an assemblage of breeding wading birds of high conservation value: Lapwing *Vanellus vanellus*, Redshank *Tringa totanus*, Snipe *Gallinago gallinago*, Black-tailed Godwit *Limosa limosa*, Oystercatcher *Haematopus ostralegus* and Curlew *Numenius arquata*. The presence of waders is generally strongly related to site

wetness, so the drainage of land for agriculture has often negatively affected breeding wader populations.

On grazing marshes, keeping dry grassland and wet pools on the fields throughout the breeding season provides good nesting and feeding habitat for birds (Ausden *et al.,* 2001). A higher water table keeps the soil soft and moist, which is especially important for Snipe and Black-tailed Godwit (Green, 1988) and keeps soil invertebrates accessible from the surface of the soil, which is essential for surface-feeding birds such as Lapwing. Additionally, shallow areas of surface water are important feeding habitats for chicks, providing a source of aquatic prey which would not otherwise be available. Nevertheless, high water content in the soil can significantly reduce vegetation growth (Ausden *et al*., 2001) and short vegetation can increase foraging rates due to the greater availability of food for the birds but increases their visibility to predators, both birds and mammals.

On lowland wet grassland sites where it is possible to maintain a raised water table, flooding by different means provides a management tool to make habitats suitable for breeding waders. In many instances, surface wetness can be increased by raising water tables through manipulation of water levels in ditches (Armstrong, 1993). The digging of scrapes has also been used for the creation of wet features on the fields.

The ES scheme, closely associated with wetland creation and restoration, has shown success in other types of habitats; for example, increasing populations of Cirl Bunting *Emberiza cirlus*, a priority conservation species in the UK. Lowland arable conversions to less intensively managed land in the South Downs and South Wessex Downs ES schemes have also been demonstrated to support higher densities of breeding Skylark *Alauda arvensis*, a declining species in the UK.

Case study: Cayton and Flixton Carrs Wetland Project

Cayton and Flixton Carrs are situated approximately 3km to the south of Scarborough (OS grid reference TA03810). The site forms part of the River Hertford floodplain within the Vale of Pickering. The Cayton and Flixton Carrs Wetland Project aims to restore wetland habitats in the area, which was formerly a mosaic of wet woodland and pasture but is currently improved grassland and arable farmland. The project is supported by a partnership of organisations including Scarborough Borough Council, the Environment Agency, Natural England, RSPB and North Yorkshire County Council and aims to create a landscape containing a mosaic of wetland habitats including pools, flushes, reed-beds and wet woodlands with extensive areas of wet grassland grazed by cattle, sheep and other livestock. The project has begun to restore arable fields to wetland habitats through Higher Level Stewardship (HLS) agreements with local farmers. Farmers are given advice on re-wetting their grassland, which means maintaining a high water table in April, May and June. This benefits ground-nesting wading birds such as Snipe, Curlew and Lapwing by providing habitat for them to nest and feed. High water tables or shallow pools in parts of the fields keep the ground soft for waders to probe for invertebrates and provide damp, bare mud patches for newly hatched chicks to feed around. Grazing is also carefully monitored to keep the perfect mix of shorter grass areas and tussocks for hiding and nesting that each wader species prefers. Figure 1 illustrates the area of wetlands created and restored (more than 200 ha) in the last 6 years under the HLS schemes managed by Cayton and Flixton Carrs Wetland project.

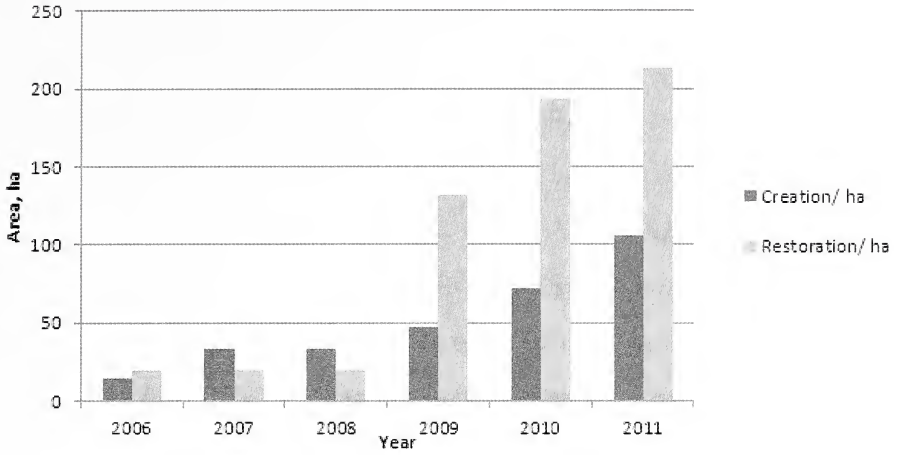


Figure 1. The area of wetland creation and restoration in Cayton and Flixton Carrs Wetland Project from the year 2006 to the year 2011.

In order to obtain baseline ecological information and to assist with landowner applications to the ES scheme, a series of ecological surveys has been commissioned by the project. There is evidence of the project being beneficial to species richness and abundance on the site. For example, a summary of bird surveys has demonstrated the increase in average bird numbers found on the project farms (Figure 2) and the Breeding Bird Survey in 2011 showed that a record number of 93 species has been recorded on one of the farms under the HLS scheme.

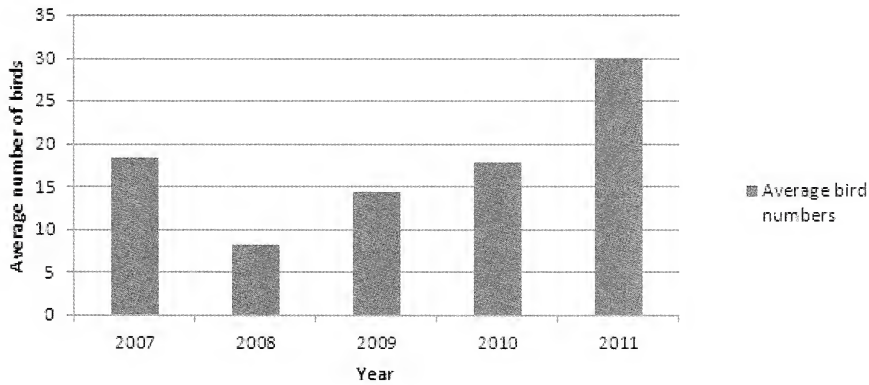


Figure 2. The average of bird numbers recorded in the Cayton and Flixton area after the start of the Wetland Project.

Over 200 wader scrapes have been created so far that provide suitable feeding for wader chicks. However, increasingly dry periods during the summer months make it difficult to keep the fields sufficiently wet. Lack of rain in the summer of 2011 reduced the areas of flooded scrapes significantly.

Implications for wetland management and restoration

Providing suitable breeding and feeding habitats for waders on commercial grazing grasslands raises many issues and, in some instances, agri-environment schemes are not considered suitable management tools (Kleijn *et al.*, 2006). Areas where surface flooding and the maintenance of a high water table is possible can be a foundation for serious conflict between management for conservation and agriculture. Commitment to ES schemes on lowland wet grassland has been low within the United Kingdom but has increased recently. Among the main factors preventing landowners from signing up to lowland wet grassland ES schemes are farm economics and the requirement for significant changes in field management. Maintenance of suitable wet habitats for waders was considered too expensive by many farmers. Flooding fields can encourage extensive vegetation death (Ausden *et al.*, 2001), making them unsuitable for grazing livestock, and the soft sediments caused by high water content in the soil can affect movement of livestock and machinery. Consequently, low-intensity grazing management is likely to be the focus in providing suitable habitats for breeding waders rather than the raising of the water table (Vickery *et al.*, 2001).

Nevertheless, the manipulation of flooding regimes provided by a system of foot-drains can allow regulation of ditch water levels to maintain flooding in wet pools throughout the breeding season, while leaving most of the land free from flooding. By employing a technique of pumps and sluices, water levels can be raised in surrounding ditches and supplied to the centre of the fields using foot-drains. The area over which these floods extend can be controlled through locating foot-drains in low areas of fields and selecting appropriate ditch water levels. It is also feasible to create wet areas by digging a scrape around a section of the foot-drain. Maintaining suitable means of water control will, however, be increasingly complicated by climate change and the predicted increase in frequency of periods of both flooding and drought (Nicholls *et al.*, 1999). Foot-drains provide a potential means of retaining water during dry months and draining excess water during floods. Hence, this technology may provide valuable control of issues related to increasingly unpredictable water supplies.

Nevertheless, abundance of species within high value pockets of habitat is frequently reliant not only upon properties of the patch but also upon processes within the surrounding area (Baillie *et al.*, 2000). As such, it is doubtful whether conserving small patches of high quality habitats within reserves will be enough to stop degradation of populations. Improved management of the wider landscape is also essential (Ausden and Hirons, 2002). A main driver of ES schemes is their potential for a landscape-scale approach to agriculture management (Dolman *et al.*, 2001), which may avoid the issue of creating fragmented high-quality habitat.

Conclusion

The environmental policy tools being developed have the potential to guide agriculture in directions that may help to stop, or at least reduce, the decline in biodiversity (Buckwell and Armstrong-Brown, 2004). Nevertheless, biodiversity and agriculture can only be united by more sustainable land management systems (Firbank, 2005) and ES schemes will be successful only if the management recommendations are adapted to the ecological needs of target species and are adequate with modern farming techniques. The appropriate financial subsidies and management advice on water table manipulation could support the recovery of breeding waders.

References

Armstrong, A. (1993). Modelling the response of in-field water tables to ditch levels imposed for ecological aims: a theoretical analysis. *Agriculture, Ecosystems and Environment*. 43: 345–351.

Ausden, M. and Hirons, G.J.M. (2002). Grassland nature reserves for breeding wading birds in England and the implications for the ESA agri-environment scheme. *Biological Conservation*. 106: 279–291.

Ausden, M., Sutherland, W.J. and James, R. (2001). The effects of flooding lowland wet grassland on soil macroinvertebrate prey of breeding wading birds. *Journal of Applied Ecology*. 38: 320–338.

Baillie, S.R., Sutherland, W.J., Freeman, S.N., Gregory, R.D. and Paradis, E. (2000). Consequences of large-scale processes for the conservation of bird populations. *Journal of Applied Ecology*. 37: 88–102.

Buckwell, A. and Armstrong-Brown, S. (2004). Changes in farming and future prospects technology and policy. *Ibis*. 146: 14–21.

Dolman, P.M., Lovett, A. and O'Riordan, T. (2001). Designing whole landscapes. *Landscape Research*. 26: 305–335.

Fuller, R.J., Gregory, R.D., Gibbons, D.W., Marchant, J.H., Wilson, J.D., Baillie, S.R. and Carter, N. (1995). Population Declines and Range Contractions among Lowland Farmland Birds in Britain. *Conservation Biology*. 9: 1425–1441.

Green, R.E. (1988). Effects of environmental factors on the timing and success of breeding of common snipe *Gallinago gallinago* (Aves Scolopacidae). *Journal of Applied Ecology*. 25: 79–93.

Hulme, P.E. (2005). Adapting to climate change: is there scope for ecological management in the face of a global threat? *Journal of Applied Ecology*. 42: 784–794.

Kleijn, D., Baquero, R., Clough, Y., Diaz, M., De Esteban, J., Fernandez, F., Gabriel, D., Herzog, F., Holzschuh, A., Johl, R., Knop, E., Kruess, A., Marshall, E., Steffan-Dewenter, I., Tscharntke, T., Verhulst, J., West, T. and Yela, J. (2006). Mixed biodiversity benefits of agri-environment schemes in five European countries. *Ecology Letters*. 9: 243–254.

Nicholls, R., Hoozemans, F. and Marchand, M. (1999). Increasing flood risk and wetland losses due to global sea-level rise: regional and global analyses. *Global Environmental Change – Human and Policy Dimensions*, 9. 69–87.

Ovenden, G., Swash, A. and Smallshire, D. (1998). Agri-environment schemes and their contribution to the conservation of biodiversity in England. *Journal of Applied Ecology*. 35: 955–960.

Robinson, Robert A .and William J. Sutherland (2002), Post-war changes in arable farming and biodiversity in Great Britain *Journal of Applied Ecology* 39: 57-176.

Siriwardena, G. M., Baillie, S. R., Buckland, S. T., Fewster, R. M., Marchant, J. H. and Wilson, J.D. (1998). Trends in the abundance of farmland birds: a quantitative comparison of smoothed Common Birds Census indices. *Journal of Applied Ecology*. 35: 24–43.

Vickery, J.A., Tallowin, J., Feber, R., Asteraki, E., Atkinson, P.W., Fuller, R.J. and Brown, V. (2001). The management of lowland neutral grasslands in Britain: effects of agricultural practices on birds and their food resources. *Journal of Applied Ecology*. 38: 647–664.

Wilson, A.M., Vickery, J.A., Brown, A.F., Langston, R.H.W., Smallshire, D., Wotton, S. and Vanhinsbergh, D. (2005). Changes in the numbers of breeding waders on lowland wet grasslands in England and Wales between 1982 and 2002. *Bird Study*. 52: 55–69.

The Anglers' Monitoring Initiative and beyond!

David Croft MA AMRAeS
email: DMCroft320@aol.com

The AMI Scheme

The Anglers' Monitoring Initiative (AMI) was launched nationally in 2007 as a Riverfly Partnership lead project which involves training volunteer groups, mainly anglers, to use a simple sampling and recording method to assess the biological quality of rivers. The observations, usually made on a monthly basis, record the presence/absence of eight aquatic invertebrate groups with the results being forwarded to a regional coordinator and delegated Environment Agency officer. The Riverfly Partnership AMI Information Pack states that "in collaboration with local organisations, [it] continues to lead the initiative to meet its core aims of working to help protect the water quality of watercourses and conserve their riverfly populations. The Riverfly Partnership is a network of organisations committed to furthering the understanding and conservation of riverfly populations". But it goes further than this!

The invertebrate groups selected are representative of those sensitive to varying degrees of pollution where a change in water quality is reflected in the abundance and number of the different invertebrates present at the time of sampling. Of the target invertebrates, seven are classed as riverflies with the eighth being the amphipod *Gammarus pulex*. The larvae of the groups of riverflies represented are: cased caddis, caseless caddis, the blue-winged olives (Ephemerellidae), flat-bodied nymphs (Heptageniidae) and olives (Baetidae) and other mayflies and stoneflies. The volunteers need only to be able to identify the invertebrates down to group level using FSC AIDGAP identification sheets (FSC, 2007) produced specifically for the scheme although, should any member wish to go beyond this stage, help is made available through collaboration of the organisations involved in setting up the AMI. Sampling kits and methodology are standardised throughout the scheme. The sampled invertebrates are 'decanted' into a large tray, identified and by group consensus the number of each group is recorded on a standard AMI recording sheet (Fig 1).

When completed all, except for the occasional specimen retained for further identification, are returned to the water. At this stage the results are entered on to a computerised results sheet to produce a simple graph that has a predetermined 'action to be taken' trigger level line in place, courtesy of the EA representative. Alternatively, the results may be sent directly to the AMI regional coordinator who will do the necessary uploading of the obtained data.

The AMI through the East Yorkshire Chalk Rivers Trust (EYCRT)

The EYCRT became involved with the AMI at the launch of the scheme and sites in the general area of Driffield were included in the early days. I joined the EYCRT in 2007 and, after completing the introductory course, started a monitoring programme on the 1st October 2007 at the Gypsey Race (a winterbourne chalk stream rising in the Yorkshire Wolds and entering the North Sea at Bridlington Harbour) at Boynton. Being a 'winterbourne' the Gypsey Race is usually dry through much of its course in the mid to late summer and autumn months with pools in some areas but without connectivity. In the Boynton stretch connectivity of standing pools has been observed during the first week of November using a 'normal' summer of conditions and the driest period for 15 years (EA, 2011) as references.

Plate I. Dormouse found in torpor during June 2011 box check in Freeholders' Wood (see p82).
R. Gaynor

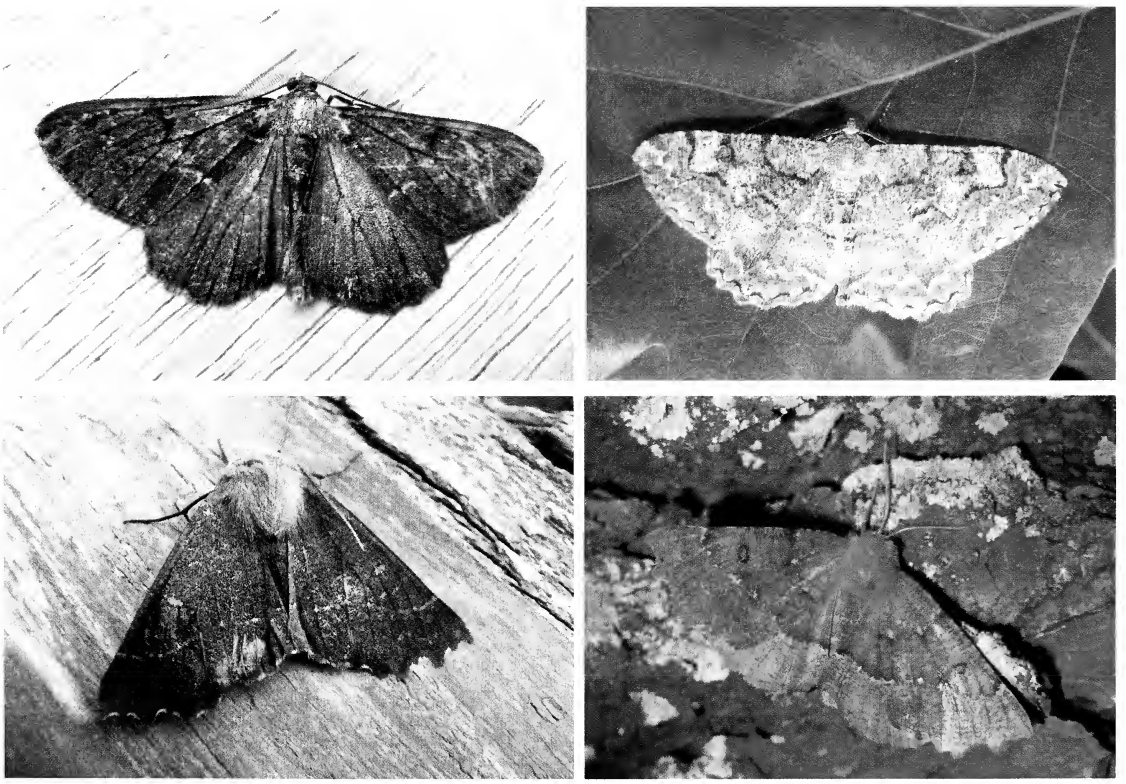


Plate II. Examples of melanic and non-melanic forms of moths. Mottled Beauty (top row) and Scalloped Hazel (bottom row) (see p97).

J.Bowers (melanics) and D.Williamson (non-melanics)

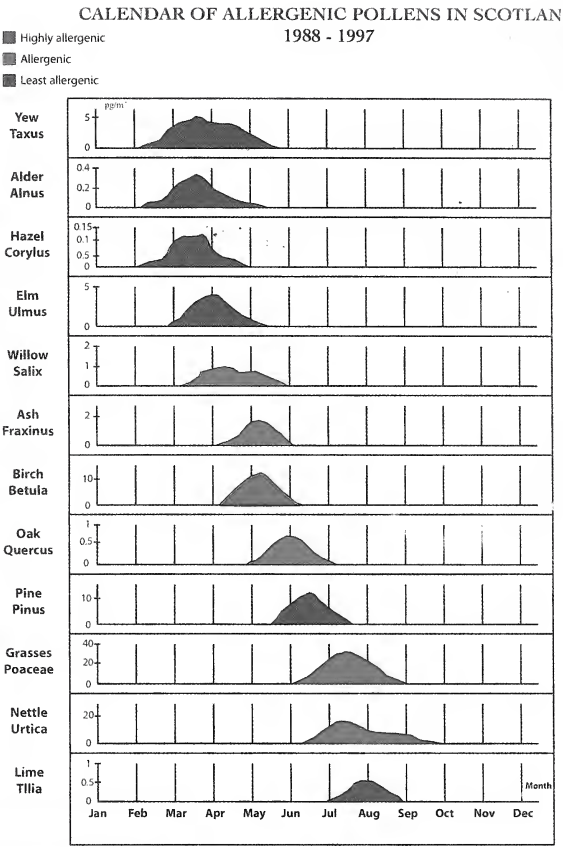


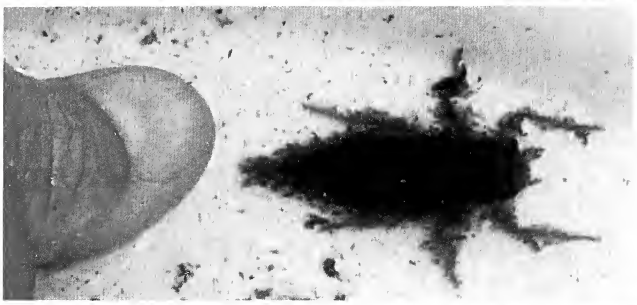
Plate III. Pine pollen study.

Above: Burkard trap in use for pollen sampling (see p101). *E.Caulton*

Right: Chart showing allergenic pollen appearance times for Scotland (see p103).

Plate IV. Scarborough Castle and its meadow (see p132). *J.Newbould*

Plate V. Anglers' Monitoring Initiative (see pp120-124).



Above left: A sampling session.

Above right: White-clawed Crayfish *Austropotamobius pallipes* from the Upper Derwent.

Left: Golden-ringed Dragonfly *Cordulegaster boltonii* nymph.

Right: Bullhead *Cottus gobio*.

Below left: Gypsey Race isolated pool.

Below right: Lab work during an AMI study.

all D.Croft

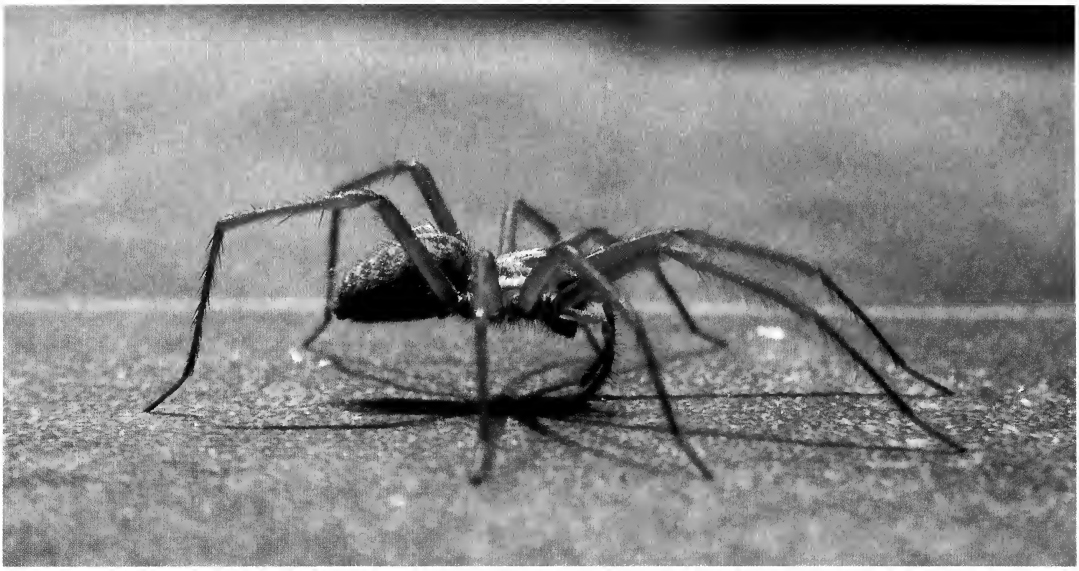
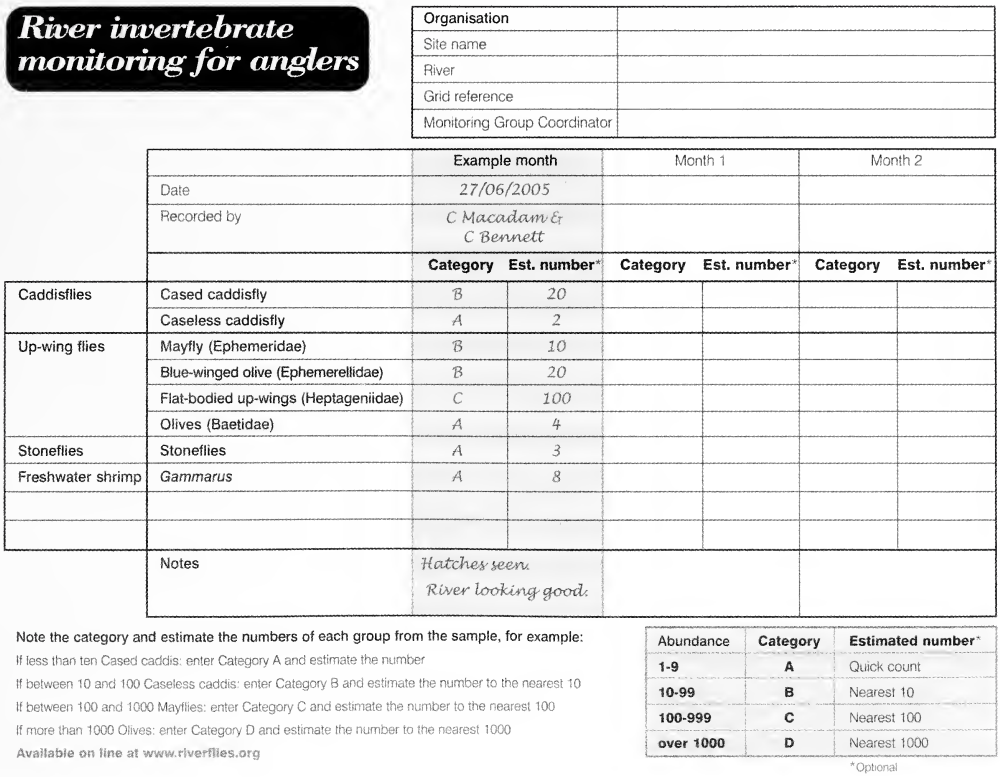


Plate VI. House spider *Tegenaria* sp. Samples of large house spiders are required for a research project (see p100). *G.Oxford*

Plate VII. Yorkshire Museum Gardens Bioblitz (see p158).
Left: Visitors examining and identifying freshwater samples.
Right: A successful young participant in the worm hunt. *C.West*



River invertebrate monitoring for anglers

Organisation	
Site name	
River	
Grid reference	
Monitoring Group Coordinator	

		Example month		Month 1		Month 2	
	Date	27/06/2005					
	Recorded by	C Macadam & C Bennett					
		Category	**Est. number***	**Category**	**Est. number***	**Category**	**Est. number***
Caddisflies	Cased caddisfly	B	20				
	Caseless caddisfly	A	2				
Up-wing flies	Mayfly (Ephemeridae)	B	10				
	Blue-winged olive (Ephemerellidae)	B	20				
	Flat-bodied up-wings (Heptageniidae)	C	100				
	Olives (Baetidae)	A	4				
Stoneflies	Stoneflies	A	3				
Freshwater shrimp	*Gammarus*	A	8				
	Notes	Hatches seen. River looking good.					

Note the category and estimate the numbers of each group from the sample, for example:
If less than ten Cased caddis: enter Category A and estimate the number
If between 10 and 100 Caseless caddis: enter Category B and estimate the number to the nearest 10
If between 100 and 1000 Mayflies: enter Category C and estimate the number to the nearest 100
If more than 1000 Olives: enter Category D and estimate the number to the nearest 1000
Available on line at www.riverflies.org

Abundance	Category	Estimated number*
1-9	A	Quick count
10-99	B	Nearest 10
100-999	C	Nearest 100
over 1000	D	Nearest 1000

*Optional

Recording sheet

Figure 1. AMI recording sheet produced for the project.

Elsewhere, except at Willow Garth SSSI, the stream bed can remain dry and, as can be expected, the stream's inhabitants respond to the physical conditions forced upon them in different ways. When these conditions interfere with the AMI programme, additional (and alternative) sampling away from the selected AMI sampling sites is undertaken to gain an understanding of the 'workings' of the stream throughout the year. During the dry period of 2009 with high temperatures in place, several shallow disconnected pools were sampled, with poor results except for one small pool that unexpectedly yielded several hundred sticklebacks and a significant number of Minnows *Phoxinus phoxinus*. An oxygen reading at mid-water showed a good oxygen level when compared to the surface oxygen, which was very low. Likewise, the water temperature throughout the pool was significantly lower than at the surface, indicating the possibility of an understream bed flow mixing with the lower/mid layers in the pool.

Further investigation of other pools revealed several that provided refuges for these small fish and in October 2009 a pool was electro-fished by the EA to reveal the presence of 14 Sea Trout *Salmo trutta* smolts. It is thought that the presence of these fish was due to their parents being able to migrate upstream from Bridlington Harbour because of higher than normal water levels in 2008/2009. Four adult fish were observed during the summer of 2010 in the same pool but were not present when the EA electro-fished at a later date. The presence of Sea Trout in the Gypsey Race is not a normal occurrence, at least as far up as Boynton and, in fact, the EA had denied that they were present in the Gypsey Race before

2009. 2010 also led to the discovery of the flatworm *Dendrocoelum lacteum* residing within a 200m stretch shaded by bankside trees. In 2011 a small, separate, population of these flatworms was found in a very small part of the stream upstream of the 2010 population. Based on the information given by Dr Hans Heidemann Lessan of the Danish Environmental Protection Agency, who has visited the site, finding the flatworm in the chalk stream at a height just above sea level has raised the question of how they arrived? Was it in recent times or are they from a post glacial 'happening'? Thoughts about this are welcome! The extremely dry conditions of 2011 were perhaps responsible for the downstream mass migration of *Gammarus pulex* observed at GR sampling site 3 at the beginning of August 2011. During routine AMI monitoring a reasonable number of *G. pulex* has been sampled at both sites 2 and 3, some 100m apart. However, on this occasion *G. pulex* were observed in large numbers at site 3 with only 1 taken at site 2. Temperature recordings taken at the two sites differed by a fraction of a degree; the water oxygen level for site 2 was supersaturated with site 3 being 'normal'. The population was observed to slowly move downstream towards the Sea Trout pool over a period of several days! Unlocking the secrets of the Gypsey Race is still ongoing and to date the revelations have been very interesting.

The EYCRT involvement in the AMI scheme expanded in 2011 when the River Derwent system was added to the Trust portfolio. Several angling clubs from the upper Derwent waters signed up to monitor their waters and sampling equipment has been issued. In some instances monitoring had been in progress prior to the introductory course with the River Rye in the Helmsley area being a part of the AMI pilot scheme. As well as being involved with the Gypsey Race, I lead the sampling with the Sinnington Anglers' Club (the Sinnington Samplers) on the River Seven. This river is a flash flood watercourse coming off the moors and is totally different in character from the chalk streams (becks) of the River Hull area. The River Seven at Sinnington is devoid of aquatic plants, mature trees line the banks and the river bed is generally made up of loose materials, mainly cobbles. Naturally, there is also a difference in the wildlife: the Golden-ringed Dragonfly *Cordulegaster boltonii* can be seen as well as Dipper *Cinclus cinclus* and Kingfisher *Alcedo atthis*. On one occasion a member of a SAC working party was bitten by an Adder *Vipera berus* as he removed some bankside debris. Most probably the snake had taken refuge in the debris in the Rosedale area and had been 'flushed' downstream when the rains arrived. The SAC member spent a week in hospital!

As with the Gypsey Race, the 'Sinnington Samplers' AMI is taken further. Those involved are keen to be able to recognise all the contents of the samples and to learn a little of the animals' lifestyles. This leads to further searching of reference materials and contacting specialists on return from the field work and then feeding back the information to the members. Some examples stand out in particular: the larva of the Golden-ringed Dragonfly (Plate V, centre pages) drew comment and the finding downstream a few days later of a dead immature Grayling *Thymallus thymallus* with the throat apparently torn away led to speculation as to the cause of the injury - could it be the larva of Golden-ringed Dragonfly? The net sampling also produces Bullheads *Cottus gobio* (Plate V, centre pages) but the fish that seems to interest locals more than others is the Stone Loach *Noemacheilus barbatulus*. Village senior citizens tell of catching these small fish in the river in their younger days and seemed disappointed that our replies were in the negative. However, recently one was caught, identified and immediately released. Both the Bullhead and Stone Loach have oxygen requirements similar to trout and along with Grayling, are representative fish indicators of well-oxygenated waters. Interestingly, the River Seven at Sinnington has not yielded any White-clawed Crayfish *Austropotamobius pallipes* although a recent AMI (2011) course held on the upper Derwent revealed them to be plentiful (Plate V, centre pages). The

Brook Lamprey *Lampetra planeri* also appears to be absent from the area although the conditions would appear to be suitable for its existence. For a variety of reasons, the Environment Agency has to be approached for permission to investigate these two species, so it is beyond the remit of the club members. Also absent in any numbers are freshwater shrimps, although occasional ones are to be found in the samples. Similarly, a comparison with the results of the AMI from the River Rye in the Helmsley area also reveals few shrimps in that part of the river. This may be due to the absence of aquatic vegetation but again, if anyone has thoughts on the subject, they will be most welcome. In respect of 'permanent' and 'temporary' habitats in the river, a study of the local river dynamics is to form part of the 'extended' AMI for Sinnington. Before leaving the subject of Sinnington AMI, a lunch break taken during one 2011 visit revealed four specimens of (possibly) *Lymnaea truncatula*, the amphibious pond snail, the intermediate host for the Common Liver Fluke *Fasciola hepatica*, in a riverside field some 3 metres above summer water level and approximately 4 metres from the water's edge.

Exciting finds from an East Yorkshire chalk stream

In October 2011 a refresher AMI course was held at Foston Beck chalk stream near Driffield, where 'experienced' monitors were updated on procedures and identification of specimens to a higher level of recognition. The course tutor was Stuart Crofts, a recognised authority on caddis flies, supported by Joanna Hood, the regional EA biologist. When the samples were 'sorted' in the trays for counting, Joanna was quick to spot a stonefly, an unexpected occurrence in an East Yorkshire chalk stream. Although very small, this was confirmed in situ by its diagnostic swimming movement before being moved to a microscope for family identification (Pryce *et al.*, 2007). A later study identified the specimen as the small brown stonefly *Nemoura avicularis*. Stuart also searched bankside vegetation with a sweep net for adult caddis and recorded *Agapetus fuscipes*, *Chaetopteryx villosa* and *Melampophylax mucoreus*. *A. fuscipes* larvae, apart from grazing on microscopic plants on gravel beds, might also include bacteria that use methane as an energy source in their diets. Methane-derived carbon makes an important contribution "during the winter and early spring before the sun can kick-start substantial photosynthesis…" (Grey, 2011). In a later note from Stuart, he stated that the caddis-fly *M. mucoreus* "is mainly found in chalk/limestone rivers. As a consequence it is not as widespread as the common (and similar) *Anabolia nervosa* (Brown Sedge)".

In conclusion

In addition to the exciting finds described above, a remote infra-red movement-triggered camera was mounted on an old brick footbridge at Boynton for a week at the beginning of August 2011. From some 3500 pictures, many triggered by passing birds, rain, wind, etc., several sequences were notable. The first was the appearance on several occasions of the 'local' Kingfisher, not seen since the very cold conditions of the 2010/2011 winter freeze. Being able to report the photographic sighting of the Kingfisher was a pleasant task and shortly afterwards sighting reports from locals started to come through. The second sequence of note was the 'fishing' pattern used by a Heron *Ardea cinerea*. Apart from a regular pattern of movement around the edge of the stream's deep pool, one picture shows the bird wading into the water and raising its wings. Suggested reasons for this behaviour include to prevent wetting the wings or to trick Minnows into the security offered by "seemingly overhead vegetation".[1]

[1] Editor's note: The standard explanation for this behaviour is to shade the water so that the bird can see the fish. Many *Ardea* and *Egretta* species do this.

The studies of both the Gypsey Race at Boynton and River Seven at Sinnington are set to continue for some time into the future, presenting possible new discoveries at each visit. Readers' inputs on the above observations will be very welcome as it is intended to extend both interest and understanding of the rivers in question for those involved with them.

Acknowledgements:
I wish to express my thanks to Stuart Crofts (The Riverfly Partnership) for help in identifying selected specimens to species level, also to Joanna Hood (Environment Agency) for checking my identification of aquatic invertebrates and to David Southall (EYCRT) for sharing his vast knowledge of the invertebrates of both the Rivers Hull and Derwent systems.

References:

FSC (2007) *River Invertebrate Monitoring for Anglers*. Field Studies Council.

Grey, J. (Autumn 2011) *Gamefisher - Greenhouse Gas & Trout Biomass*.. Salmon & Trout Association.

Maitland, P. S. & Campbell, R. N. (1992) *Freshwater Fishes adults and larvae*. Field Studies Council.

Pryce, D., Macadam, C. & Brooks, S. (2007) *Guide to the British Stonefly (Plecoptera) Families*. Harper Collins

---

Farmland bird conservation schemes of the Scarborough Carrs

Tim Burkinshaw
email: tim.burkinshaw@scarborough.gov.uk

The Carrs of the Vale of Pickering, largely by-passed by visitors to the Yorkshire moors and coast, are well worth closer inspection by naturalists, not least birdwatchers. Recent years have seen a proliferation of new Higher Level Stewardship (HLS) agreements in the eastern Carrs, facilitated by The Cayton and Flixton Carrs Wetland Project (see p115 of this issue) and measures are beginning to pay dividends. This project has particularly targeted the enhancement of breeding wader habitat on remnants of UKBAP floodplain grazing marsh within a patchwork of intensive arable production, for which the Vale is perhaps better known. The landscape restoration quietly going on here in the last 5 years is both dramatic in scale and subtle in approach.

The Scarborough Carrs area, in the eastern part of the Vale, is the focus of a VC62 YNU field excursion in July 2012. This visit will provide unparalleled access to private farmland which has seen little if any focussed recording effort for most taxa. For the purposes of this article The Scarborough Carrs is taken to be the lowland fen peat floodplain of the Rivers Hertford and Derwent east of the road between Sherburn and Brompton and extending as far as Muston. Stopping just 2km short of the North Sea the ground rises gently by some 15-20m elevation, on boulder clay deposits left by the same ice sheet responsible for the

damming up of the Vale in the last glacial period and the subsequent westward re-direction of drainage.

Water level management has been introduced in localised areas through the HLS schemes together with a large number of artificial wader scrapes. With over two hundred such scrape features dug since 2010 and forty-six water control structures across 300 hectares of wet grassland under restoration, this project has shown local farm businesses a new way to view difficult land with challenging drainage. It should not be thought an easy option and wetland HLS agreements are not taken on lightly. But with the help of a Wetland Project Officer farmers are beginning to turn around the fortunes of some of our iconic farmland birds and bring wider benefits to the landscape for wildlife, heritage and archaeology.

Accessibility issues

The Vale of Pickering Carrs area is predominantly private farmland with a marked absence of statutory designated sites or nature reserves. The Derwent and its eastern tributary the Hertford are for the most part well removed from the main road network, with large tracts of the river corridor and associated Carrs accessible only by unclassified lanes which terminate at the river banks or at isolated farmsteads. However a network of footpaths and bridleways provides access to some areas worthy of attention. This article focuses principally on bird interest, describing some of the more regularly visited sites known to local birders and how to access them. Whilst the main driver of the schemes has been about breeding waders, there is much potential for the specialist in other taxa, and the author has high hopes that the paucity of records might be roundly addressed by this summer's excursion.

Whilst the following accounts describe access points by car and on foot there are local bus services on the A64, A1039, A170 and A165 run by Yorkshire Coastliner (843 and 845) and by Scarborough and District (118, 121 and 128)

Star Carr, Seamer Carr and Flixton Carr

Local records reflect the greater attention paid by birders to this part of The Carrs and its relative accessibility to Scarborians. It is a wonderful area to watch Barn Owls at dusk and counts of six are not unusual. Formerly a regular wintering site for Short-eared Owls and the occasional Hen Harrier, sadly sightings have decreased in recent years, but both are still seen here. Long Eared Owls have made a showing in the early part of 2012. The recent change in status of Little Egrets in Yorkshire has resulted in this area of The Carrs becoming a frequent wintering area with sightings also through the late summer and autumn. A walk along the River Hertford banks (not a public right of way but regularly used by locals between Folkton Bridge and A64 Bridge) will often produce Green Sandpiper and any drainage ditch may reveal wintering Water Rails. A tactic employed is to stand on Flixton Bridge at dusk and Water Rails often swim across the river. You may also glimpse Otter here. Seamer Carr landfill site to the north brings thousands of gulls, though its closure as an active tip is imminent as we go to press. Glaucous and Iceland Gulls are occasionally recorded in winter. Gulls often rest in fields at Seamer Carr viewed from the A64. This area often holds parties of Whimbrel in the spring. Passage periods also regularly turn up one or two sightings of Marsh Harrier over this area.

Access: From the A1039 at Flixton village head north on Flixton Carr Lane. Drive down the lane to park at Flixton Bridge (TA039811). On foot a circuit is possible using the riverbank as far as Star Carr, in which case park in Flixton near Orchard Lodge. Bus service:118 Scarborough and District bus serves Flixton.

Potter Brompton Carr and Sherburn Ings
The creation of numerous scrapes at Potter Brompton Carr is making this site increasingly attractive to wildfowl and waders. This was a 2010 development, with water level management improvements in Feb 2012. Already it has shown great promise, in its first winter alone attracting wintering wader flocks including Golden Plover, Snipe, Dunlin and Ruff and ducks including over 200 Teal. The real success has been the instant improvement for breeding waders, notably around 30 pairs of Lapwing raising on average one chick per pair, plus territories held by Curlew and Snipe and Oystercatcher.

The area to the west towards Sherburn has always been a popular stop off for birders looking for raptors. May to September are the most productive months with Hobby, Marsh Harrier and Common Buzzard the target birds, but Rough-legged Buzzard has been recorded in a past winter.

Ruston Carr Bridge is a good vantage point at the north side; turn north off A64 at Sherburn village and take the next right after the level crossing. In about 1km park near the bridge over the River Derwent (SE962795). By public transport you can alight in Brompton from the 128 service bus and make a circuit using Acres Lane footpath to pick up the lane to Ruston Carr Bridge, returning on Brompton Ings Road.

Only part of Potter Brompton Carr is viewable at present as the scheme is on private land but at the wettest times in winter view from the public bridleway just south of Hay Bridge (SE978790). From the A64 follow the signs to Ganton Golf Course, park near here and walk north over the level crossing, following the rough track to Hay Bridge. The fields east of Bogg Hall are good for winter flocks feeding on wild birdseed crops while the barns themselves are frequented by a resident Tree Sparrow colony. Coastliner Bus 843 or 845.

Cayton Carr, Loders Carr and Folkton Carr
These flat low-lying fields are to the west of Carr Lane which links Cayton and Folkton villages. The area is mostly grazed by sheep and the short-cropped grass interspaced with small pools in late winter/early spring can be an excellent birding site. The fields don't always have pools in a dry autumn, but it is still well worth a check at any time of year. A pull-in at TA056809 is a good place from which to observe. A particular delight is to watch the displaying Lapwings on a cool spring morning from the warmth of your car!

Loder's Carr is a favoured haunt of Whimbrel and Curlew in spring, while Folkton Carr on the opposite side of the Hertford holds further Stewardship sites benefitting from water level management in the breeding season, where Lapwing nest in good numbers.

Flotmanby Carr and Well Springs
Park just north of the waste water treatment works on Carr Lane (TA056806) and walk east along the southern bank of the Hertford to Flotmanby Carrs. Marsh Harriers are increasingly seen from May to September. Areas of rushes hold good numbers of Sedge Warblers, and Green Sandpiper is frequently seen along the river, with occasional Little Egret sightings. The fields north of the river have often held a wintering herd of Whooper Swans. Just beyond the slight bend in the canalised river a new HLS scheme is installing sluices and in-field scrapes in late winter 2012.

Well Springs is a similar area just to the east, where the floodplain tapers to its point of origin at Muston Bottoms. This eastern terminus of the Carrs is well served by footpaths and surprisingly close to Filey (3km). With pubs in Gristhorpe and Muston there are good options

which can make a pleasant circuit or add-on to a trip to the coast. Well Springs is a breeding site for Snipe as well as Lapwing and Yellow Wagtail. Small scrapes on the adjacent fields of Manor Farm, created in 2010 and 2011 should add interest to this area. Well Springs itself is best viewed from a track running north-east from Manor Farm on the A1039 (TA080798). The farmer has created a small picnic site part-way down this track, which offers a convenient vantage. Designated a restricted byway this track is not open to motorised vehicles - please seek permission if you wish to park in the farmyard. Better still, start in Muston and make a circuit along the river, at this point a modest stream called Main Drain.

Willerby Carr, Binnington Carr and Staxton Carr
This is one of the more reliable places to see Corn Buntings. They are rather elusive in the winter months but more easily seen when they are singing from May to July. Flooded fields in winter attract geese and swans and wet fields in autumn have proved to be good for waders. The copses and trees along the River Derwent hold breeding Willow Tits, Marsh Tits and Blackcaps. Arable fields in summer have several pairs of Yellow Wagtails. Anything can, and does, turn up. One birder found a male Red-backed Shrike whilst looking for Corn Buntings in June 2010. Grasshopper Warbler has also been heard, while in winter Tundra Bean Geese have been recorded several times. Wildfowl from Wykeham Lakes just to the north often feed in this area.

Access: Park near the church in Willerby village TA008791 and walk westwards along the track. The fields before the railway crossing are the best area for Corn Bunting. Alternatively walk Willerby Carr Lane, east of the church, passing through a large cattle pasture with extensive wet scrapes for Lapwing and Curlew before crossing the river to the small copses either side of the railway at Robin's Bottom. A further set of fields parallel to the river are undergoing restoration for breeding waders while an adjacent conifer belt has been felled to make way for native carr woodland.

Staxton Carr to the east of Willerby Carr Lane also holds some new HLS grassland restoration, with several options for a circuit. Groundworks are scheduled late winter 2012 including scrapes and a sluice. Lapwing, Oystercatcher and Curlew have held territories here in the last few years. Check the modern barn at the head of Ings Lane for a thriving Tree Sparrow colony, aided by inventive use of the timber boarding to create built-in nesting spaces.

Records of all taxa are welcomed by the Project Officer.

Acknowledgement
The author wishes to thank Nick Addey at Scarborough Birders

The wasps, ants and bees (aculeate Hymenoptera) of the 'Green Spaces' of Scarborough Town

Michael E. Archer 17 Elmfield Terrace, York, YO31 1EH

Introduction

The records for this paper were abstracted from the Watsonian electronic database of the aculeate Hymenoptera for the sites or localities of Scalby, Scalby Mills, Scarborough, Scarborough Castle, Scarborough Mere, Scarborough North Bay and Scarborough South Bay. Many early records are only given for Scarborough so that the recording sites within Scarborough Town are unknown.

Recorders and Determiners

The main recorders, with their dates of recording and their determiners if known, were G.B. Walsh (1919-1937, M.E. Archer, unknown), D.W. Bevan (mainly 1922, also 1908, 1932, unknown), W.D. Hincks (mainly 1943, also 1959, W.D. Hincks, M.E. Archer, D. Morgan), T.H. Riley (1971-1973, M.E. Archer) and M.E. Archer (1974-1979, 1996-2011, M.E. Archer). Recorders producing few records (with determiners, if known, in brackets) were: L. Auckland (M.E. Archer), I.H. Burkill, R. Butterfield, J.H. Flint (J.H. Flint), A. Grayson (A. Grayson), R. Lawson, J.D. Ward (D.Morgan) and J. Wood (M.E. Archer).

Number of Species

Table 1 shows the number of species and records that have been recorded in Scarborough town. The full list with authorities is given in the appendix.

Table 1. The number of species and records recorded for each family or subfamily of aculeate Hymenoptera recorded from Scarborough Town.

	No. of species	No. of records
Solitary wasps		
Dryinidae	1	1
Chrysididae	3	9
Pompilidae	4	3
Eumeninae	5	12
Crabronidae	12	17
Total solitary wasps	25	42
Solitary bees		
Colletidae	2	3
Andrenidae	11	28
Halictidae	14	26
Megachilidae	5	9
Apidae	8	18
Total solitary bees	40	84
Total solitary species	65	126
Social species		
Formicidae	5	
Vespinae	5	
Apidae	19	
Total social species	29	
Total aculeate species	**94**	

The only other Yorkshire urban site that has been investigated for its solitary wasps and bees is Sheffield (Archer, 2009a). From Sheffield, 65 solitary wasps have been recorded from 387 records (6.0 records per species) and 69 solitary bees from 590 records (8.6 records per species). The smaller number of solitary wasp and bee species recorded from Scarborough Town (Table 1) may be a consequence of its smaller size, but the smaller number of records per species of solitary wasps (1.7) and solitary bees (2.1) indicates that much less recording has been carried out in Scarborough Town.

The taxonomic groups with the most species are the Crabronidae amongst the solitary wasps and the Halictidae, closely followed by the Andrenidae, amongst the solitary bees. The large number of species of bumblebees (Apidae) includes four species (*B. distinguendus*, *B. humilis*, *B. ruderatus* and *B. sylvarum*) which are now extinct in Yorkshire.

Species Quality

Within a Yorkshire context, the solitary species can be divided into four abundance groups (Rare, Occasional, Frequent, Common) depending on the number of 1km squares in which a species has been recorded. The solitary species, excluding the dryinid record, recorded from Scarborough include 40 Common, 14 Frequent, six Occasional (*Chrysis rutiliventris*, *C. viridula*, *Lasioglossum nitidiusculum*, *Coelioxys elongata*, *Nomada integra*, *Anthophora plumipes*) and four Rare (*Andrena nitida*, *Megachile ligniseca*, *Coelioxys inermis*, *Melecta albifrons*) species. Giving each species a status of 1 (Common), 2 (Frequent), 4 (Occasional) and 8 (Rare) and adding the statuses for each species give a Quality Score of 124, which if divided by the number of species (64) gives a Species Quality Score of 1.9. The solitary aculeates of Sheffield have a higher Quality Score of 484 and Species Quality Score of 3.6 probably because it is an inland site at lower latitude as well as having the increased recording activity.

The ant species are common and widespread except for *Formicoxenus nitidulus* which can be considered Rare and *Monomorium pharaonis* which is only found in warm buildings. The social wasps and bumblebees with the honey bee are common and widespread species except for the extinct bumblebee species and probably *Bombus barbutellus* and *B. rupestris* which may be considered as Occasional. The last record from Yorkshire for *B. distinguendus* was 1951, *B. humilis* 1968, *B. ruderatus* 1954 and *B. sylvarum* soon after 1951 (Archer, 2009b). *B. rupestris* probably became extinct in Yorkshire soon after 1950 but has reappeared since 2001.

Cleptoparasitic Load

The cleptoparasitic load (CL) is the percentage of aculeate species that are cleptoparasitic (or parasites) on other host aculeates. Wcislo (1987) showed that parasite behaviour among bees was more numerically pronounced in temperate than tropical regions (N = 114 samples, between 5-80° N). Wcislo indicated that parasitic rates are higher in temperate regions, as host populations are more synchronised in their life-history characteristics than in tropical regions. This finding probably does not hold for desert regions where the occurrence of rainfall would tend to synchronise life history characteristics. Wcislo also reviewed the wasp literature, reaching the same conclusion but did not carry out a numerical investigation. From a review of the literature, Wcislo found that the CLs for bees in Europe varied between 16-33%, a range of 17%. For 30 Yorkshire sites, the CLs for the solitary bees varied from 21.2-40.5%, a range of 19.3% (Archer, unpublished) so supporting Wcislo (1987). The CLs for Scarborough Town fall within this range (Table 2).

The CLs of solitary wasps from 30 sites vary between 10.3-25.0%, a range of 14.7% (Archer, unpublished), so the Wcislo (1987) may also apply to the solitary wasps. The CLs for Scarborough Town fall within this range (Table 2).

Table 2 – The relative frequency of the cleptoparasitic (or parasitoid) species among the solitary species for Scarborough Town.

	No.cleptoparasites (C)	No. possible hosts (H)	Cleptoparasitic Load CL = 100 x C/(H+C)
Solitary wasps	3*	21	12.5%
Solitary bees	11	29	27.5%

**Anteon jurineanum* excluded as its host is non-aculeate

Aerial Nester Frequency

The aerial-nester frequency (AF) is the percentage of non-parasitic aculeate species that have aerial nest sites. Aerial nesters use old beetle burrows in dead wood, central stem cavities (e.g. bramble), old snail shells, or crevices in cob walls, old mortar, or nests exposed on the surface of rock or other hard material. Subterranean nesters nest in the soil, usually in burrows dug by them, but sometimes existing holes and crevices are used after being altered.

The AFs for the solitary species are given in Table 3. From a sample of 30 Yorkshire sites, the very variable AFs for solitary wasps were between 0-90.0% and for solitary bees between 6.7-40.0% depending on the availability of nest sites (Archer, unpublished). The AF for all the British species of solitary wasps is 46.2% and for solitary bees is 17.9%. The AFs for the solitary wasps are higher than, and for the solitary bees similar to, the national values. The higher AF for the solitary wasp species could be a consequence of the lack of recording activity or possibly the records known only as Scarborough are from gardens which are known to have a high AF (Archer, 2009a).

Table 3 – The nesting habits of the solitary species recorded from Scarborough Town.

	No. aerial nesters (A)	No. subterranean nesters (S)	Aerial nester frequency AF = 100 x A/(A+S)
Solitary wasps	13	8	61.9%
Solitary bees	5	24	17.2%

References

Archer, M.E. (2009a) The solitary wasps and bees (Hymenoptera: Aculeata) of the 'Green Spaces' of urban Sheffield. *Entomologist's Monthly Magazine* 145: 11-25.

Archer, M.E. (2009b) Lost and found bumblebees (Hymenoptera: Apidae, *Bombus*) of Watsonian Yorkshire, with the introduction of a new Yorkshire species. *The Naturalist* 134: 121-127.

Wcislo, W.T. (1987) The role of seasonality, host synchrony, and behaviour in the evolutions and distributions of nest parasites in Hymenoptera (Insecta), with special reference to bees (Apoidea). *Biological Reviews* 62: 515-543.

Appendix – Species recorded in Scarborough

DRYINIDAE: *Anteon jurineanum* Latreille.

CHRYSIDIDAE: *Chrysis ignita* (Linn.), *C. rutiliventris* Abeille de Perrin, *C. viridula* Linn.

FORMICIDAE: *Formicoxenus nitidulus* (Nylander), *Leptothorax acervorum* (Fab.), *Monomorium pharaonis* (Linn.), *Myrmica rubra* (Linn.), *M. ruginodis* Nylander.

POMPILIDAE: *Arachnospila anceps* (Wesmael), *A. spissa* Schiødte, *Dipogon variegatus* (Linn.), *Priocnemis schioedtei* Haupt.

EUMENINAE: *Ancistrocerus oviventris* (Wesmael), *A. parietinus* (Linn.), *A. parietum* (Linn.), *A, scoticus* (Curtis), *Odynerus spinipes* (Linn.).

VESPINAE: *Dolichovespula norwegica* (Fab.), *D. sylvestris* (Scopoli), *Vespula germanica* (Fab.), *V. rufa* (Linn.), *V. vulgaris* (Linn.).

CRABRONIDAE: *Argogorytes mystaceus* (Linn.), *Crabro cribrarius* Fab., *Crossocerus dimidiatus* (Fab.), *C. elongata* (Van der Linden), *C. megacephalus* (Rossi), *Ectemnius continuus* (Fab.), *E. lapidarius* (Panzer), *Lindenius albilabris* (Fab.), *Mellinus arvensis* (Linn.), *Pemphredon lugubris* (Fab.), *Rhopalum clavipes* (Linn.).

COLLETIDAE: *Colletes succinctus* (Linn.), *Hylaeus hyalinatus* Smith.

ANDRENIDAE: *Andrena bicolor* Fab., *A. clarkella* (Kirby), *A. fucata* Smith, *A. fulva* (Müller *in* Allioni), *A. fuscipes* (Kirby), *A. haemorrhoa* (Fab.), *A. nigroaenea* (Kirby), *A. nitida* (Müller), *A. semilaevis* Pérez, *A. scotica* Perkins, *A. wilkella* (Kirby).

HALICTIDAE: *Halictus rubicundus* (Christ), *H. tumulorum* (Linn.), *Lasioglossum albipes* (Fab.), *L. calceatum* (Scopoli), *L, cupromicans* (Pérez), *L. fratellum* (Pérez), *L. leucopus* (Kirby), *L. nitidiusculum* (Kirby), *L. rufitarse* (Zetterstedt), *L. smeathmanellum* (Kirby), *L. villosulum* (Kirby), *Sphecodes geoffrellus* (Kirby), *S, gibbus* (Linn.), *S. monilicornis* (Kirby).

MEGACHILIDAE: *Coelioxys elongata* Lepeletier, *C. inermis* (Kirby), *Megachile centuncularis* (Linn.), *M. ligniseca* (Kirby), *Osmia rufa* (Linn.).

APIDAE (solitary): *Anthophora furcata* (Panzer), *A. plumipes* (Pallas), *Melecta albifrons* (Forster), *Nomada goodeniana* (Kirby), *N. integra* Brullé, *N. leucophthalma* (Kirby), *N. marshamella* (Kirby), *N. panzeri* Lepeletier,

APIDAE (social): *Bombus distinguendus* Morawitz, *B. hortorum* (Linn.), *B. humilis* Illiger, *B. hypnorum* (Linn.), *B. jonellus* (Kirby), *B. lapidarius* (Linn.), *B. lucorum* (Linn.), *B. pascuorum* (Scopoli), *B. pratorum* (Linn.), *B. ruderatus* (Fab.), *B. sylvarum* (Linn.), *B. terrestris* (Linn.), *B. barbutellus* (Kirby), *B. bohemicus* (Seidl), *B. campestris* (Panzer), *B. rupestris* (Fab.),*B. sylvestris* (Lepeletier), *B. vestalis* (Geoffroy *in* Fourcroy), *Apis mellifera* Linn.

Scarborough Castle – an urban location for a meadow

John Newbould Stonecroft, 3 Brookmead Close, Sutton Poyntz, Weymouth DT3 6RS
email: john_newbould@btinternet.com

Scarborough Castle is located on a prominent headland 78m above sea level, centred on national grid TA0589 between Scarborough's North and South Bays. Initially an Iron Age hill fort, it was later occupied by the Romans who operated a coastal signal station. The present infrastructure was built by Henry II and was damaged in World War I by German naval bombardment. In Word War II a covert listening post was established. English Heritage opens the Castle to the public (see Plate IV, centre pages).

Our visit to the Castle was on 3rd June 2011 as part of the Scarborough Bioblitz. Of particular interest is the *circa* 8ha herb-rich hay meadow within the walls, which, being located in a predominantly urban area, is particularly unusual. It contains typical grasses of lowland meadows such as Sweet Vernal-grass, Meadow Fescue, Red Fescue, Sheep's Fescue, Meadow Foxtail and Cock's-foot. Herbs present include: Yarrow, Common Knapweed, frequent Pignut, Common Cat's-ear, Hairy Hawk-bit, frequent Bird's-foot Trefoil, Mouse-eared Hawkweed, Meadow Buttercup and Common Sorrel. These species are typical of national vegetation community **MG5** *Cynosurus cristatus – Centaurea nigra* grassland (Rodwell, 1992).

There is no scrub; coarse species *e.g.* thistles and Hogweed provide less than 1% cover. The sward height was *circa* 300mm with herb cover at more than 20%. There was little bare ground and no indicators of waterlogging. In a farmland situation, this would qualify for High-level Stewardship as a lowland meadow BAP habitat (code GO6) (Anon, 2004 and Anon, 2010). Management is by an annual cut.

Lepidoptera present included many Chimney Sweeper *Odezia atrata* moths, which are found along the coastal strip and elsewhere in east Yorkshire (Hill *et al.,* 2011), and on a dull day just Common Blue butterfly. Few birds were seen associated with the Castle, but I noted a single Skylark, Meadow Pipits and a pair of Peregrine Falcons, one of which Mr M. Carroll noted was carrying a Starling back to its breeding site on the eastern ramparts.

Bibliography

Anon, (2004) *Common Standards Monitoring Guidance for Lowland Grassland Habitats*. J.N.C.C., Peterborough.

Anon, (2010) *Higher Level Stewardship: Environmental Stewardship handbook,* 3rd edition Natural England, Sheffield.

Hill, L., Randle, Z., Fox, R. and Parsons, M. (2011) *Provisional Atlas of the UK's Larger Moths.* Butterfly Conservation, Wareham.

Rodwell, J. (1992) Ed. *British Plant Communities* 3, *Grasslands and montane communities.* .

The land, freshwater and marine molluscs of Scarborough

Adrian Norris 17, West Park Drive, Leeds LS16 5BL
Recorder, Yorkshire Conchological Society.

Since the publication of the second volume of *The Natural History of the Scarborough District* by The Scarborough Field Naturalists' Club in 1956 (Walsh & Rimington, 1956), many nomenclatural changes have occurred and a number of additions to the molluscan fauna have been recorded. In addition, as a direct result of an ongoing mapping project in Yorkshire, our understanding of the distribution of species within the county is now much improved. In the two lists below I have included common, or vernacular, names for the species for which such names have been widely accepted.

The coverage of the original publication encompassed an area bounded by Bridlington in the south, Robin Hood's Bay to the north and as far inland as Malton. The chapter on marine mollusca edited by Prof Spaul (pp 42-64) and the chapter by E. Arnold Wallis and Athol J. Wallis on the land and freshwater mollusca (pp 336-350) followed this format. However, in this review I will restrict myself to a tighter area bounded by Yons Nab to the south, Scalby Ness Rocks to the north and extending no further inland than the Hackness area. This restricted geographical area features a number of species from both the marine and land and freshwater faunas which, in reality, have not been recorded in the close vicinity of Scarborough. In order to keep the faunal lists as short as possible I have restricted myself to those records that post-date the 1956 publication mentioned above and, even then, only to the most important new changes and additions.

Land and freshwater molluscs

Arnold & Athol Wallis recorded about 118 species from the larger area but this included several species such as *Theba pisana, Helix pomatia, Viviparus viviparus* and *V. contectus*, all of which had been introduced into the area. Several other species, such as *Omphiscola glabra, Myxas glutinosa, Vertigo pusilla, Gyraulus leavis, Musculium transversum, Unio tumidus* and the semi-marine *Leucophytia bidentata,* have not been recorded in the immediate vicinity of Scarborough for over sixty years and, therefore, appear no longer to occur. Two species, *Helicigona lapicida* and *Margaritifera margaritifera,* have never been found close to Scarborough and a further two species, *M. glutinosa* and *Unio tumidus,* are now extinct in their former locations. One species not referred to at all is *Succinea oblonga,* known to have occurred on Castle Hill at Scarborough. First recorded in 1850, it was still on Castle Hill in 1898 when William Cash re-found it. No later records have come to light and the species is now also thought to be extinct in the Scarborough area.

A large number of nomenclatural changes have taken place over the past sixty years and many new species have been recognised over the same period, some as splits but others as introductions to the British molluscan fauna.

Notes on habitats

Situated as they are between the North York Moors National Park and the North Sea, Scarborough and its environs have a wide variety of rich and varied habitats. The richest area for the land and freshwater molluscs is Forge Valley (including the woodland along Lady Edith's Drive and Throxenby Mere), the eastern end of which, Rowbrow Wood, extends within the town boundary. Over 90 species have been recorded from Forge Valley and its

environs. Whilst other local sites may not be as rich, they also contain a wide variety of species, some of which are not known from within the Forge Valley complex of habitats.

Annotated list of additional land and freshwater species recorded between 1952 and 2012

All records are by Adrian Norris unless otherwise stated. Nomenclature after Anderson, 2005 The species list is in alphabetical order. In a few instances the prefix cf. is placed before the specific name of some species; this is due to there being some doubt about the specific identification of British material as compared with original type material relating to these splits which originates from material collected in Europe.

Arion ater (Linnaeus, 1758) Large Black Slug. The segregate of this species does occur, but most records are aggregates of both *Arion ater* and *A. rufus*

Arion flagellus Collinge, 1893 Durham Slug. Peasholm Park (TA0389) 2009; Falsgrave Road (TA0287) 2009

Arion (Carinarion) circumscriptus Johnston, 1828 The segregate of this species is common and widespread

Arion (Carinarion) fasciatus (Nilsson, 1822). Crossgates (TA0384) 2007; South Cliff Gardens (TA0447987563) 2011; Scarborough Mere (TA0385); Falsgrave (TA0386) 2010

Arion (Kobeltia) distinctus Mabille, 1868. The segregate of this species is very common and widespread

Balea heydeni von Maltzan, 1881. This species has been segregated from *Balea perversa*. All the old records of *Balea* must therefore be considered as aggregate records. The only confirmed records for *Balea* are for this segregate and are from Forge Valley, the most modern being from walls at SE983869, 2010

Boettgerilla pallens Simroth, 1912 Worm Slug. Hackness (SE967907) 1992, 2009; Prospect House Farm, Suffield (SE9990) 2009; Whin Bank, Scarborough (TA028881) 2000

Carychium minimum O.F.Müller, 1774 Herald Snail. The segregate of the species is common and widespread

Carychium tridentatum (Risso, 1826) Slender Herald Snail. The segregate of the species is common and widespread

Cochlicopa cf. ***lubrica*** (O.F.Müller, 1774) Slippery Moss Snail. The segregate of the species is common and widespread

Cochlicopa cf. ***lubricella*** (Rossmässler, 1834). Common in Forge Valley but appears to be scarce in other sites

Columella aspera Walden, 1966. Forge Valley, (SE9887) 1987; Throxenby Mere (TA0088) 1999;

Columella edentula (Draparnaud, 1805). Throxenby Mere (TA0088) 1999; Cayton Bay (TA0685) 2005; Common in Forge Valley

Deroceras panormitanum (Lessona & Pollonera, 1882) Caruana's Slug. Common and widespread, mainly on waste ground

Euconulus cf.***alderi*** (J.E. Gray, 1840). Forge Valley, (SE9985/SE9887/SE9886) 1999; Cayton Bay (TA0685) 2005; Seamer (TA0183) 2009

Euconulus cf. ***fulvus*** (O.F.Müller, 1774). Forge Valley, (SE9985/SE9887/SE9886) 1999; Throxenby Mere (TA0088) 1987; Cayton Bay (TA0685)1992, 2005

Malacolimax tenellus (O.F. Müller, 1774) Slender Slug. Raincliffe Woods (SE9988) 1982 David E.Whittaker

Lehmannia valentiana (A.Férussac, 1822) Spanish Slug. Scarborough (TA0487) 2009; Peasholme Park Ravine (TA0389) 2009; Italian Gardens (TA0461987264) 2010

Limacus maculatus (Kaleniczenko, 1851). Scarborough (TA0486) 2009; (TA0388) 2009; Italian Gardens (TA0461987264) 2010; South Cliffs (TA044875) 2011 Terry Crawford

Oxyloma elegans (Risso, 1826) Pfeiffer's Amber Snail. This species was previously known as *Oxyloma pferifferi* and all earlier records refer to this species
Pupilla muscorum (Linnaeus, 1758) Moss Chrysalis Snail. West Ayton (SE9884) 1964; Forge Valley (SE9887) 1987 (SE9985) (SE9886) 1999
Tandonia budapestensis (Hazay, 1881) Budapest Slug. Common and widespread, mainly on waste ground
Vitrea contracta (Westerlund, 1871) Milky Crystal Snail. Common and widespread
Vitrea crystallina (O.F.Müller, 1774) Crystal Snail. Common and widespread
Lymnaea (Stagnicola) fuscus (C.Pfeiffer, 1821). (see note below)
Lymnaea (Stagnicola) palustris (O.F.Müller, 1774) Marsh Pond Snail (see note below).
Note:*Lymnaea palustris* has been split into several species, two of which (genus *Stagnicola*) are recognised in Yorkshire. Adult specimens need to be dissected to establish which of the two species occurs in the Scarborough district.

Marine Mollusca

The distribution of marine species along our coast is still not fully understood, due to the difficulties of collecting material from below low water mark and the small number of recorders reporting their finds. Nomenclatural changes and changes in our understanding of species over the past sixty years have resulted in a few splits and combinations within the marine molluscs. For example, *Venerupis pullastra* and *V. saxatilis* are now considered to be a single species: *Venerupis senegalensis* (Gmelin, 1791). The same is true for *Hiatella arctica* and *H. striata,* the latter of which is now considered to be an environmental variant. Other species such as *Patella depressa* and *Gibbula umbilicalis* are south- and west-coast species and have been removed from the Yorkshire list. A few species have been synonymised, for example *Architeuthis clarkei* is now considered a junior synonym of *Architeuthis dux* Steenstrup, 1857. The checklist below contains only those marine records from the sea area defined above with specific location data and which have been reported since the publication of *The Natural History of Scarborough*.

A small number of papers has been published over this period which update the marine molluscs of the wider area covered by the original publication, these include Jardine, 1984 and Norris, 1973, 1974 & 1978. (Note: the record of *Patella intermedia* recorded from Thornwick Bay and Filey Brigg in 1972 proved to be in error). Many of the additional species recorded from this wider area, however, have not been fully published and this alone highlights the limits of our knowledge of the marine molluscs found in the vicinity of Scarborough.

A dredging trip to Maw Wyke Hole off Robin Hood's Bay (NZ9510) on 1974 produced a number of new and interesting records including the following bivalves *Similipectem similis* (Laskey, 1811), *Limatula subauriculata* (Montagu, 1808), *Goodallia triangularis* (Montagu, 1803), *Moerella pygmaea (*Loven, 1846) and *Jupiteria minuta* (O.F. Muller, 1776). Perhaps the most interesting new records for the area are three species reported by Claude Poizat in August 1975 from offshore in 56m of water (NZ9510): *Microhedyle glandulifera* (Kowalevsky, 1901), *Philinoglossa helgolandica* Hertling, 1932 and *Empletonia pulchra* (Alder & Hancock, 1844). Two of these are meiobenthic opisthobranchs which live interstitially in the muddy sands.

Notes on habitats

The rock pools at Scalby Ness, Black Rock in South Bay, Osgodby Point and Yons Nab are all rich in intertidal species. The interconnecting beaches at Cayton Bay and South and North Bays at Scarborough are generally not as rich in sand-dwelling species. Offshore sandy habitats, however, constantly produce surprises and require further investigation.

Annotated checklist of marine species recorded between 1956 and 2012

All references to North Bay and South Bay should be taken to mean North Bay Scarborough and South Bay Scarborough unless otherwise specified. Records are by Adrian Norris unless stated otherwise, plus Chris Barrett, Paul Brazier, Pascal Dubois, Zoe Frank, Brian Goodwin, Anthony Hurd, Mike Kendall, Paula Lightfoot, David Lindley, Roger Merchant, Mark Pickering, Tony Wardhaugh. M.F.V. = Motor Fishing Vessel. Nomenclature is that used by the Conchological Society of Great Britain and Ireland. Marine species are listed in scientific order.

Coat-of-mail Shells

Lepidopleurus asellus (Gmelin 1791) . South Bay (TA0487) 1972

Tonicella rubra (Linnaeus, 1767). Scalby Ness Rocks (TA037908) 2011 various recorders; South Bay (TA0487) 1974, 1977; (TA0586) 2010

Lepidochitona cinerea (Linnaeus, 1767) Common Chiton. Scalby Ness Rocks (TA0390) 1971; (TA037908) 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977; (TA0586) 2010; (TA052868) 2011 PL; (TA052803) 2011 various recorders; (TA047876) 2011 MK; (TA050872) 2011 BG; North Bay (TA037907) 2011 MK; Black Rocks (TA055866) 2011 DL; Yons Nab (TA0884) 1973

Acanthochitona crinita (Pennant, 1777) Keeled Chiton. North Bay Scarborough (TA037907) MK 2011; South Bay (TA0487) 1972; (TA0586) 2010, Cayton Bay (TA0684) 2005; Yons Nab (TA0884) 1973

Gastropods

Patella vulgata (Linnaeus, 1758) Common Limpet. Scalby Ness Rocks (TA0390) 1973, 2010; 2011 various recorders; North Bay (TA0394489579) 2009; South Bay (TA0487) 1972, 1974, 1977, 2009; (TA052868) 2011 PL; (TA050872) 2011 BG;(TA048881) 2011 PB; (TA047876) 2011 various recorders; Black Rocks (TA0586) 2009, 2010; (TA055866) 2011 DL; White Nab (TA0586) 1972; Osgodby Point (TA0685) 2005; Cayton Bay (TA0684) 2005; (TA075840) 2009; (TA077842) 2011 BG; Yons Nab (TA0884) 1973

Patella ulyssiponensis (Gmelin, 1791) China Limpet. Scalby Ness Rocks (TA037908) 1973; 2011 PB

Helcion pellucidum (Linnaeus, 1758) Blue-rayed Limpet. Scalby Ness Rocks (TA0390) 1973; South Bay (TA0487) 1971, 1972, 1974, 1977; (TA047876) 2011 MK; (TA048881) 2011 PB; (TA052868) 2011 PL; Osgodby Point (TA0685) 2005; Cayton Bay (TA075840) 2009; Yons Nab (TA0884) 1973

Tectura virginea (O F Müller, 1776) White Tortoiseshell Limpet. Scalby Ness Rocks (TA0390) 1973; South Bay (TA0487) 1972, 1974, 1977; Yons Nab (TA0884) 1972, 1973

Margarites helicinus (Phipps, 1774) Pearly Top Shell. Scalby Ness Rocks (TA0390) 1971, 1973; South Bay (TA0487) 1974; Yons Nab (TA0884) 1973

Gibbula cineraria (Linnaeus, 1758) Grey Top Shell. Scalby Ness Rocks (TA0390) 1973 to 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977, 2009; (TA047876) 2011 MK; (TA0586) 2010; (TA050872) 2011 BG; (TA052868) 2011 MP, PL; Black Rocks (TA0586) 2009; (TA055866) 2011 DL; Osgodby Point (TA0685) 2005; Cayton Bay (TA075840) 2009; Yons Nab (TA0884) 1973

Lacuna vincta (Montagu, 1803) Banded Chink Shell. Scalby Ness Rocks (TA0390) 1971; 1973 (TA030909) 2011 MK; South Bay (TA0487), 1972, 1974, 1977; (TA050872) 2011 BG; Osgodby Point (TA0685) 2005; Cayton Bay (TA075840) 2009; Yons Nab (TA0884) 1972, 1973

Lacuna pallidula (da Costa, 1778) Pallid Chink Shell. Scalby Ness Rocks (TA0390) 1971,1973; South Bay (TA050872) 2011 BG; Cayton Bay (TA075840) 2009

Littorina littorea (Linnaeus, 1758) Common Periwinkle. Scalby Ness Rocks, (TA0390) 1973; 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977; 2009; (TA0586) 2010; (TA052868) 2011 PL,RM; (TA047876) 2011 various recorders; (TA077842) 2011 BG;

Black Rocks (TA055866) 2011DL; Cornelian Bay (TA0685) 1972; Cayton Bay (TA0684) 2005; (TA077842) 2011 BG

Littorina saxatilis (Olivi, 1792) Rough Periwinkle. Scalby Ness Rocks (TA0390) 1973; 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977, 2009; (TA0586) 2010; (TA050872) 2011 BG; (TA052868) 2011 PL; (TA0444087983) 2009; (TA047876) 2011 various recorders; Black Rocks (TA0586) 2009; (TA055866) 2011 DL; Osgodby Point (TA0685) 2005; Cayton Bay (TA0684) 2005; (TA077842) 2011 BG; (TA075840) 2009; Yons Nab (TA0884) 1973

Littorina saxatilis var ***tenebrosa*** (Montagu, 1803). Scalby Ness Rocks (TA0390) 1973; South Bay (TA0047) 1972; Yons Nab (TA0884) 1973

Littorina arcana Hannaford-Ellis, 1978. Scalby Ness Rocks (TA037908) 2011 various recorders

Littorina obtusata (Linnaeus, 1758) Flat Periwinkle. Scalby Ness Rocks (TA0390) 1971; 2011 various recorders; South Bay (TA0586) 2010; (TA0487) 1974, 2009; (TA050872) 2011 BG; (TA052868) 2011 various recorders; Black Rocks (TA0586) 2009; Cayton Bay (TA075840) 2009; (TA077842) 2011 BG; Yons Nab (TA0884) 1973

Littorina fabalis (Turton, 1825). Scalby Ness Rocks (TA0390) 2011 MK; South Bay (TA050872) 2011 BG

Melarhaphe neritoides (Linnaeus, 1758) Small Periwinkle. Scalby Ness Rocks (TA0390) 2011 various recorders; South Bay (TA0487) 1972; 1977; (TA0586) 2010; (TA047876) 2011 MK; Black Rocks (TA055866) 2011 DL; Osgodby Point (TA0685) 2007; Cayton Bay (TA075840) & (TA067844) 2009

Onoba semicostata (Montagu, 1803). Scalby Ness Rocks (TA0390) 1973; South Bay (TA0487) 1974; Cayton Bay (TA0844) 1972; Yons Nab (TA0884) 1972

Manzonia crassa (Kanmacher in G. Adams, 1798). South Bay (TA0487) 1974

Alvana punctura (Montagu, 1803). South Bay (TA0487) 1974

Rissoa parva (da Costa, 1778). Scalby Ness Rocks (TA0390) 1971, 1973, 2011; South Bay (TA0487) 1974, 1977; (TA048881) 2011 PB; (TA052868) & (TA052802) 2011 PL; (TA047876) 2011 MK; (TA075840) 2005 BG; Cayton Bay (TA075840) 2009; Yons Nab (TA0884) 1973

Skeneopsis planorbis (Fabricius, 1780). Scalby Ness Rocks (TA0309) 1971; South Bay (TA0487) 1972; Yons Nab (TA0884) 1973

Turritella communis (Risso, 1826) Tower Shell. M.F.V. Provider (TA196835) 2011

Nucella lapillus (Linnaeus, 1758) Dog Whelk. Scalby Ness Rocks (TA0390) 1971, 1973, 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977, 2009 (TA0586) 2010; (TA047876) 2011various recorders; (TA052868) 2011 PL; (TA048881) 2011 PB; (TA050872) 2011 BG; Black Rocks (TA0586) 2009; (TA055866) 2011 DL; Osgodby Point (TA0685) 2005; Cayton Bay (TA077842) 2011 BG; Yons Nab (TA0884) 1973

Ocenebra erinaceus (Linnaeus, 1758) European Sting Winkle. Black Rocks (TA055866) 2011 DL

Colus gracilis (da Costa, 1778). South Bay (TA047876) 2011 MK

Buccinum undatum Linnaeus, 1758 Common Whelk. North Bay (TA0390) 1972; South Bay (TA0487) 1977; (TA0586) 2010; (TA052868) 2011 RM, PL

Hinia reticulata (Linnaeus, 1758) Netted Dock Whelk. South Bay (TA047876) 2011 MK; (TA052868) 2011 ZF, PL

Hinia incrassata (Ström, 1768) Thick-lipped Dog Whelk. Scalby Ness Rocks (TA0390) 1972, 1973; (TA037908) 2011 PB; South Bay (TA0487) 1972, 1974; (TA050872) 2011 BG; Black Rocks (TA0586) 2009; Yons Nab (TA0884) 1973

Brachystomia scalaris (Macgillivray, 1843). Scalby Ness Rocks (TA0390) 1973

Sea Slugs

Aplysia punctata (Cuvier, 1803) Sea Hare. South Bay (TA0586) 2010

Berthellina plumula (Montagu, 1803) Yellow-plumed Sea Slug. Yons Nab (TA0884) 1972

Goniodoris nodosa (Montagu, 1808). Scalby Ness Rocks (TA0390); South Bay (TA0487) 1974; Yons Nab (TA093837) 1972; (TA0884) 1973

Goniodoris castanea Alder & Hancock, 1845. South Bay (TA0487) 1972
Ancula gibbosa (Risso, 1818). Scalby Ness Rocks (TA0390) 1972; South Bay (TA0487) 1974
Acanthodoris pilosa (Abildgaard in O.F. Muller, 1789). Yons Nab (TA0884) 1972
Onchidoris bilamellata (Linnaeus, 1767). Scalby Ness Rocks (TA0390) 1973; South Bay (TA0586) 2010; (TA052868) 2011 CB; Yons Nab (TA0884) 1973
Palio nothus (Johnston, 1838). South Bay (TA0487) 1972
Archiodoris pseudoargus (Rapp, 1827) Sea-lemon. Scalby Ness Rocks (TA0390) 1973, (TA030909) 2011 MK; (TA037908) 2011AH; South Bay (TA0487) 1972, 1974; Osgodby Point (TA0685) 2005; Yons Nab (TA0884) 1973
Jurunna tomentosa (Cuvier, 1804). North Bay (TA037908) 2011
Facelina auriculata (O.F. Muller, 1776). South Bay (TA0487) 1972, 1974
Aeolidia papillosa (Linnaeus, 1761) Common Grey Sea Slug. South Bay (TA0487) 1971, 1972, 1974; (TA052868) 2011 ZF

Pulmonata
Phytia denticulata (Montagu, 1803). South Bay (TA0487) 1972; White Nab (TA0586) 1972

Tusk Shells
Antalis entalis (Linnaeus, 1758). M.F.V. Provider (TA196835) 2011

Bivalves
Nucula nitidosa (Winckworth, 1930). M.F.V. Provider (TA196835) 2011; South Bay (TA0586) 2010; Black Rocks (TA0586) 2009
Anomia ephippium Linnaeus, 1758. South Bay (TA0487) 1977; (TA052868) 2011 PL; Cayton Bay (TA0684) 2005 TW
Heteranomia squamula (Linnaeus, 1758). M.F.V. Provider (TA196835) 2011; Scalby Ness Rocks (TA0390) 2011 various recorders; South Bay (TA047876) 2011 MK; Black Rocks (TA0586) 2005, 2009; (TA055866) 2011 DL; Osgodby Point (TA0685) 2005; Cayton Bay (TA0684) 2005; (TA075840) 2009
Mytilus edulis (Linnaeus, 1758) Common Mussel. M.F.V. Provider (TA196835) 2011; Scalby Ness Rocks (TA0390) 2011 various recorders; South Bay (TA0487) 1972, 1974, 1977, 2009, 2010; (TA050872) 2011 BG; (TA052868) 2011, 2011 PL; (TA048881) 2011 PB; (TA047876) 2011 various recorders; Black Rocks (TA0586) 2009; (TA055866) 2011 DL; Osgodby Point (TA0685) 2005; Cayton Bay (TA0684) 2005; (TA075840) 2009 various recorders; (TA077842) 2011 BG; Yons Nab (TA0884) 1973
Modiolus modiolus (Linnaeus, 1758) Horse Mussel. South Bay (TA0487) 1971, 1972, 1977; (TA052868) 2011 PL; Cayton Bay (TA075840) 2009
Musculus discors (Linnaeus, 1767) Green Crenella. South Bay (TA0487) 1974
Pecten maximus (Linnaeus, 1758) Great Scallop. Freshly caught specimens landed in Scarborough in spring of 2011, but no specific locality could be identified
Chlamys varia (Linnaeus, 1758) Variegated Scallop. M.F.V. Provider (TA196835) 2011; Cayton Bay (TA075840) 2009
Aequipecten opercularis (Linnaeus, 1758) Queen Scallop. South Bay (TA0487) 1974, 1977; (TA052868) 2011 PD
Kellia suborbicularis (Montagu, 1803). Scalby Ness Rocks (TA0390) 1971; South Bay (TA0487) 1974, 1974
Lasaea adansoni (Gmelin, 1791). South Bay (TA0487) 1974); Yons Nab (TA0884) 1973
Arctica islandica (Linnaeus, 1767) Islandic Cyprina. mainly fragments or dead shells; M.F.V. Provider (TA196835) 2011; South Bay (TA0487) 1974, 1977; (TA0487) 2009; (TA0586) 2010; (TA052868) 2011 PL; Cayton Bay (TA0684) 2005
Acanthocardia echinata (Linnaeus, 1758) Prickly Cockle. M.F.V. Provider (TA196835) 2011; South Bay (TA0487) 1977
Cerastoderma edule (Linnaeus, 1758) Common Cockle. South Bay (TA0487) 1974, 1977
Dosinia exoleta (Linnaeus, 1758) Rayed Artemis. South Bay (TA0487) 1977

Chamelea gallina (Linnaeus, 1758). M.F.V. Provider (TA196835) 2011; South Bay (TA0586) 2010

Venerupis senegalensis (Gmelin, 1791) Pullet Carpet Shell. Scalby Ness Rocks (TA0390) 1973; South Bay (TA0487) 1974, 1977; South Bay (TA0586) 2010; Yons Nab (TA0884) 1973

Turtonia minuta (Fabricius, 1780). Scalby Ness Rocks (TA0390) 1971; Cayton Bay (TA075840) 2009

Mactra stultorum (Linnaeus, 1758) Rayed Trough Shell. South Bay (TA0487) 1977; (TA0586) 2010

Spisula elliptica (Brown, 1827). M.F.V. Provider (TA196835) 2011; South Bay (TA0586) 2010

Lutraria lutraria (Linnaeus, 1758) Common Otter Shell. M.F.V. Provider (TA196835) 2011; South Bay (TA0586) 2010

Donax vittatus (da Costa, 1778) Banded Wedge Shell. South Bay (TA0586) 2010

Angulus tenuis (da Costa, 1778) Thin Tellin. South Bay (TA0487) 1974; (TA0586) 2010; Black Rocks (TA0586) 2009

Fabulina fabula (Gmelin, 1791) South Bay (TA0487) 1974

Abra alba (W Wood, 1802). M.F.V. Provider (TA196835) 2011; South Bay (TA0487) 1974; Cayton Bay (TA075840) 2009

Abra prismatica (Montagu, 1808). South Bay (TA0586) 2010; (TA075840) 2009

Gari fervensis (Gmelin, 1791) Faroe Sunset Shell. M.F.V. Provider (TA196835) 2011

Ensis ensis (Linnaeus, 1758) Common Razorfish. South Bay (TA0487) 1977; Black Rocks (TA0586) 2009

Ensis siliqua (Linnaeus, 1758) Pod Razorfish. South Bay (TA0586) 2010; Cayton Bay (TA0684) 2005

Phaxas pellucidus (Pennant, 1777) South Bay (TA0487) 1974

Hiatella arctica (Linnaeus, 1767) Wrinkled Rock-borer. Scalby Ness Rocks (TA0390) 1973, 2011 various recorders; South Bay (TA0487) 1974, 1977; Cayton Bay (TA0684) 2005; (TA075840) 2009; Yons Nab (TA0884) 1973

Zirfaea crispata (Linnaeus, 1758) Oval Piddock. Scalby Ness Rocks (TA0390) 1971. 1973; South Bay (TA0487) 1972, 1974, 1977

Squids

Loligo forbesii Steenstrup, 1856 Common Squid. South Bay (TA0487) 1974

References

Anderson, R., (2005) An annotated list of the non-marine mollusca of Britain and Ireland *J. Conch.* 38:(6):607-637

Jardine, I.W., (1984) The Occurrence of *Littorina* spp. In Robin Hood's Bay, North Yorkshire, with a key to British Species. *The Naturalist* 109:3-9

Norris, A., (1973) Conchological Section Marine Survey. *The Naturalist* 98:71-73

Norris, A., (1974) Conchological Section Marine Survey. *The Naturalist* 99:37-38

Norris, A., (1978) Report of the field meeting held on the Yorkshire Coast 15-16 October 1977 *Conchologists' Newsletter* 64:(March):68-69

Walsh, G.B., & Rimington, F.C., (1956) *The Natural History of the Scarborough District Volume 2*. The Scarborough Field Naturalists' Society, Scarborough

Biographical notes on the Hull taxidermist-dealer Robert Dunn, his son Joseph and other possible family members: newspaper gleanings

R. B. Williams Norfolk House, Western Road, Tring, Herts. HP23 4BN
e-mail: ray.coxitec@tesco.net

Introduction

Robert Dunn (1789–1859) of Hull was a professional taxidermist-dealer and the author of *The Ornithologist's Guide to the Islands of Orkney and Shetland* (Dunn, 1837). Prefacing a modern facsimile of that book, Limbert (2007) provided some biographical notes on Dunn and his son Joseph (1827?–1872), who succeeded to his father's business in 1859. While researching the publishing history of Dunn's book, I discovered a number of newspaper items that supplement Limbert's account. The main sources were the online digitized archives of the *Hull Packet,* the *Hull Packet and Humber Mercury* (British Library) and *The Times*.

Death of Robert Dunn's father?

Limbert (2007: 1) recorded that Robert Dunn was the son of a Joseph Dunn of Liverpool and that Robert eventually moved to Hull, although it is not known when, nor whether he moved with the rest of his family. A possible clue occurs in *The Hull Packet* of 7th April, 1812, where the death is recorded at "Stainton, Lincolnshire" of a Joseph Dunn, aged 66, the father of Mrs Thackray of Hull. Could this Joseph have been Robert's father? He would have been of the right age and there are two Staintons within about 30 miles of Hull, where his daughter lived. Did Robert have a sister, living locally, married to a Mr. Thackray? These facts and queries merit further research.

Robert's natural history business in Hull

Robert was already established as an "animal preserver" by 1823 (Limbert, 2007: 1), and he was to become a well-respected exponent of his art. For instance, in 1831, we find in the article below a reference to "a distinguished animal preserver, (Mr. Dunn)", presumably Robert, when he would have been 41 years old. This was in the month before his first visit to Shetland on 21st March, 1831 (Dunn, 1837). Apparently his life-like stuffed specimens were much appreciated and he maintained a "museum", apparently his trade showroom (Brears and Davies, 1989). Unfortunately, however, his depredation of the local bittern population at this time is notable.

> ORNITHOLOGY.—The frequent appearance of the bittern *(ardea stellaris)*, this winter, is a circumstance deserving the attention of naturalists. They are what may be considered scarce birds ; for we find, on enquiry of a distinguished animal preserver, (Mr. Dunn) that he has seldom more than one or two in a season, sometimes not one, whereas he has had 17 this year. One of these specimens is to be seen in Mr. Goodill's window, in Junction-street. They are remarkably beautiful birds of a bold and characteristic appearance and have been considered peculiarly interesting to ornithologists, from their scarcity and retired habits. Those we have seen, preserved by Mr. D. retain their spirited form and attitude, in a striking degree, and convey to the lover of natural history a vivid impression of the beauty of these singular birds. Mr. Dunn has also in his museum a remarkable variety of the common pheasant ; it is of a silvery ash colour, faintly marked with the peculiarities of its species, and, as far as his observation has gone, is unique.
>
> *The Hull Packet and Humber Mercury*, 22nd February 1831

Robert recorded a disappointingly unsuccessful collecting expedition made in 1834 to Holland (Dunn, 1837: 1–2):

> "I unfortunately arrived in Holland when the shooting-season had expired; and so strictly are their penalties enforced against any offender of the game laws, that I could not even carry a gun without subjecting myself to a fine. I stopped a month in the country, travelling from place to place all the time, and saw several of the birds I went with the intention of procuring, such as Spoonbills, Purple Herons, Quails, Golden Orioles, several of the Falcon tribe, &c., but was obliged to return without them, highly mortified at my disappointment".

It was surprising, therefore, to discover the following offer of skins for sale in July 1834; whether intentional or not, the impression is given that the skins were acquired in Holland during his visit earlier in the year. Did Robert manage, contrary to his later disavowal, to shoot some birds; or did he obtain some ready-prepared skins from Dutch collectors or dealers whom he met during his expedition? Certainly, depending on the time of year, it might have been difficult to procure some of the named birds in Holland.

R. DUNN
BIRD AND ANIMAL PRESERVER,
29, GEORGE-STREET.
(LATE OF 10, CASTLE-STREET.)

Begs leave to inform his Friends and the Public, that he has just returned from Holland, and has for Sale a quantity of BIRDS' SKINS, principally Aquatic, of the rarest kinds, consisting of Eider Ducks, Velvet ditto, Long-tailed ditto, Arctic Gulls, Stormy Petrels, &c. &c. He begs leave also to observe that having formed a Correspondence in Holland, Shetland and the Orkneys he will regularly receive a Supply of the Birds frequenting these Places, and will be happy to accommodate those Gentlemen who may favour him with an Order.
P.S.—A Quantity of EGGS daily expected from the Orkneys and Shetland.

The Hull Packet, 4th July 1834

The advertisement above incidentally provides an address additional to those already known (*cf.* Limbert, 2007: 1), namely 29, George Street, from where Robert must have moved to no. 31 by the time he published *The Ornithologist's Guide to the Islands of Orkney and Shetland* (Dunn, 1837).

From tradesman to polite society

In May 1836, the Hull Literary and Philosophical Society appointed a Mr. Dunn as curator of its museum. That this person was Robert Dunn is apparently confirmed by a newspaper article 20 months later, which records a donation of birds' eggs passing through his hands to the Society's museum. It may be questioned whether Robert was competent to care for insects as well as birds for the Society but, in fact, it is known that he already had experience of collecting and preparing insects for his own museum-showroom (Brears and Davies, 1989). Perhaps he supplied insects, most likely Lepidoptera and Coleoptera, to collectors in the area; investigation of local museum collections may pay dividends.

HULL LITERARY & PHILOSOPHICAL SOCIETY
REPORT OF THE COUNCIL, MAY 3, 1836

Your Council have to announce the resignation of Mr. Pearsall ; they also announce the appointment of Mr. Dunn to keep in order the birds and insects of the Museum.

The Hull Packet, 6th May 1836

ORNITHOLOGY.—Yesterday week, Mr. Robert Dunn, of George-street, received through the Rev. Luke Dennis, of Beverley, a nest of the hedge-warbler *(accentor modularis)*, containing

two eggs, to be presented to the Museum of the Hull Literary and Philosophical Society. They were taken from a hedge in the presence of Mr. Brigham, of Beverley (through whose kindness they were forwarded here), on the 29th of December, 1837, and the nest then contained three eggs, one of which was accidentally broken, on a farm occupied by Mr. Hill, Sledmere-field, on the Wolds.

The Hull Packet, 19th January 1838

From Hull to the northern Scottish islands

Robert left Hull in 1842 to live closer to where he could obtain rare birds, settling at Hellister on Shetland Mainland (Limbert, 2007: 3–5). He later removed from Shetland to Orkney at some time after 11th April 1853; indirect evidence suggests that it was probably in 1854 (Limbert 2007: 23). This is now corroborated by an advertisement in *The Times* which provides a latest date of 4th March 1854. The same advertisement was carried on 19th October, 1854, p. 3; 26th March, 1855, p. 6; and 11th September, 1855, p. 1:

TO NATURALISTS.—ROBERT DUNN, Author of the "Ornithologist's Guide to Orkney and Shetland" begs to inform his friends and the public that he has REMOVED from Shetland to Orkney, and that he has constantly on sale, at moderate prices, properly prepared skins and eggs of all the Orkney and Shetland birds, of which a list, with prices affixed, will be forwarded, post free, on application to R. Dunn, Stromness, Orkney.

The Times, 4th March 1854, p. 3

Yet further afield – Icelandic excursions

Two other advertisements provide information about the bird-collecting trips to Iceland of Robert and his son Joseph Henry. The date of one of Robert's Iceland visits is now revealed, as well as the place from which he travelled, which facts were hitherto unknown (Limbert 2007: 20). The advertisement below shows that a trip to Iceland was undertaken in the summer of 1855 and, taking into account the now confirmed date of Robert's removal from Shetland, he must have travelled from Orkney. This does not, of course, preclude previous visits to Iceland starting from Shetland, or even before 1842 from Hull.

TO NATURALISTS.—ROBERT DUNN, Author of "The Ornithologist's Guide to Orkney and Shetland" begs to inform his friends and the public that he has constantly on SALE, at moderate prices, properly PREPARED SKINS and EGGS of all the Orkney and Shetland birds ; also a great variety of other rare British Eggs, many of which were collected by himself in Iceland during the past summer. A list, with prices affixed, will be forwarded on application (with a postage stamp enclosed) to R. Dunn, Stromness, Orkney.

The Times, 21st March 1856, p. 4

Joseph, the new proprietor

Robert's son, Joseph Henry, made more than one trip to Iceland. Although their timing was until now vague, some are known to have been before 1863 (Limbert 2007: 25). The advertisement below suggests a rather firmer date, probably no later than the summer of 1859, but most likely even earlier than that, in which case Joseph's first Iceland trips must have been with his father in the 1850s.

TO NATURALISTS.—JOSEPH DUNN, son of the late Robert Dunn, author of "The Ornithologist's Guide to Orkney and Shetland" having succeeded to his father's business, begs to inform his friends and the public that he has constantly on SALE, at moderate prices, properly-prepared SKINS and EGGS of all the ORKNEY and SHETLAND BIRDS. Also a great variety of other rare British eggs, many of which were recently collected by himself in Iceland. A price list will be forwarded on application, with a postage stamp enclosed, to J. Dunn, Stromness, Orkney.

The Times, 13th January 1860, p. 3

Joseph's claim to have collected eggs "recently" from Iceland strongly suggests the 1859 season (perhaps May to June). Since his father Robert died in Hull on 1 July 1859 (Limbert, 2007), Joseph may well have been travelling alone on that occasion and, perhaps, was not present at his father's death. Later, when he took over the family business, he must have made further trips on his own. Cole's (2006) note that Joseph was selling eggs by 1861 may now be amended to an earlier definite date of 13th January 1860; however, Joseph was no doubt able to have supplied clients with eggs and skins immediately on taking over the business in mid-1859.

Joseph was drowned at the age of 45 in a boating accident off Stromness in 1872. He had married a Stromness lady (Limbert, 2007: 8), who can now be identified as Catherine Gray Dunn. The following is copied from a manuscript transcription of his widow's death notice in a local newspaper, found loose in a copy of Robert's *Ornithologist's Guide*.

> Death. At the South End, Stromness, on the 27th ult., Catherine Gray Dunn, widow of the late Mr. J. H. Dunn, Naturalist. From our obituary column it will be seen that Mrs. Dunn, widow of the late Mr. Joseph Henry Dunn, naturalist, died on the morning of Sunday last. Mrs. Dunn was a member of one of the oldest families in town, and was justly esteemed by a large circle of friends. She was a good friend to the poor, and will be much missed by the many recipients of her unostentatious charities. She was a member of the Free Church, to the various schemes of which she was a liberal contributor, and took a deep interest in the congregation here.
>
> *Stromness News*, 1st August 1884

William – another relative?

Searching of *The Hull Packet* revealed that the name Dunn was not uncommon in Hull, particularly among ship-owners (and, incidentally, among drunkards and felons!). Nevertheless, it is probable that a certain William Boynton Dunn, who apparently maintained Robert's business while he was away on collecting trips, was a relative; William was married in Hull in 1831 but his exact relationship with Robert is not known (Limbert, 2007: 19). However, a little more information about him has been found.

William was clearly building his own reputation both as an "animal preserver" and as an authority on ornithology, as evidenced by his lecturing to the Mechanics' Institute. It appears that he was well-established enough by 1832 to have provided illustrative specimens for his lecture.

> MECHANICS' INSTITUTE.—On Thursday evening, Mr. W. B. Dunn delivered a lecture on ornithology, before a large attendance of members, which was illustrated by a variety of specimens of British and foreign birds.
>
> *The Hull Packet and Humber Mercury*, 25th December 1832

Unfortunately, William died only 19 months later, while on a collecting trip to Norway.

> DEATHS
>
> Lately, near Gillesland, Norway, where he had gone for the purpose of collecting objects of Natural History, Mr. W. B. Dunn, animal preserver, of this place. Mr. Dunn's death was caused by his being seized with a fit while bathing. He was a young man of great promise, and was universally beloved by all who knew him.
>
> *The Hull Packet*, 25th July 1834

Being, in 1834, a "young man", and having married in 1831, William was perhaps only in his early to mid-twenties when he died. Could he have been one of Robert's sons? Family

details provided by Limbert (2007: 2–3) indicate that Robert was accompanied by one of his sons "about twelve years of age" when he visited Orkney in 1832; and Joseph went with him to Shetland in 1835, when he was about eight years old. Those sons were therefore born in about 1820 and 1827, respectively, the children of Robert's first wife, since Robert married a second time in 1832 (and subsequently a third time). It is not impossible, therefore, that the unfortunate William was an older son of Robert's first marriage, born perhaps in about 1809, when Robert would have been approximately 20 years old. Alternatively, since Robert had at least three siblings (although of unknown gender), William might have been his nephew.

Whatever may be the case, speculation about William's parentage might be proved or disproved if more could be discovered about the date and offspring of Robert's first marriage, and the progeny and migrations of his male siblings (if any). However, such investigations extend beyond the scope of the present paper.

Acknowledgements
I am grateful to Martin Limbert for critically reading an early typescript of this note and for valuable advice that improved it. Professor W. Estlin Waters kindly gave permission to reproduce his copy of Catherine Dunn's death notice.

References

Brears, P. and Davies, S. (1989) *Treasures for the People. The Story of Museums and Galleries in Yorkshire and Humberside*, Yorkshire and Humberside Museums Council, Leeds.
Cole, A. C. (2006) *The Egg Dealers of Great Britain*, Peregrine Books, Leeds.
Dunn, R. (1837) *The Ornithologist's Guide to the Islands of Orkney and Shetland. T*he author, Hull.
Limbert, M. (2007) A man called Dunn from Hull, pp. 1–29 prefacing facsimile of Dunn, R., *The Ornithologist's Guide to the Islands of Orkney and Shetland*, Peregrine Books, Leeds.

Scarborough Museum Trust

Karen Snowden Head of Collections

Scarborough's Natural History Collections

These have their origins in the Scarborough Philosophical Society, which began life in 1827 and most of the important specimens in the Scarborough collections were acquired during the stewardship of the Philosophical Society. The Society's first objective was to build a museum and library for the use of members and the edification of the public, at least of those who could afford the one shilling entry fee. The Scarborough Museum, as it was then known, opened in 1829 with a modest collection of fossils and a borrowed collection of stuffed birds. In 1840 John Wharton donated a complete mounted specimen of a male giant tortoise which is thought to be from Charles (Floreana) Island in the Galapagos. Other important gifts include the Great Auk's egg bequeathed to the Scarborough Philosophical & Archaeological Society by Alwin Bell, the Little Bustard donated by Dr Peter Murray in 1839 and the Great Bustard reputed to be the specimen shot at Foxholes in 1835, the last Yorkshire record. The

Walter Reeves herbarium, thought to be among the best in the country, was donated to the Society by his family after his death. In 2000 the entire herbarium was moved to Liverpool Museum for extensive conservation and updating. It has since returned and is once again available to researchers.

In 1923 the Society bought a collection of British and foreign land, freshwater and marine shells associated with William Bean II (1787-1866) from the estate of his son Eugene Bean. The collection was significantly overhauled and added to by Walter J. Gyngell (1856?-1933) in 1926 and was reorganised, catalogued and updated by Adrian Norris in 1969. In 2000 the collection was moved into new storage cabinets and recorded on a database.

In 1937 the Scarborough Museum and its contents were transferred to the ownership of Scarborough Corporation. Plans were laid to create a separate museum of natural history but these were delayed by the outbreak of war. In 1952 Wood End, former home of the Sitwell family, opened as a museum of natural history. The existing collections were supplemented by a large collection of trophy heads of exotic animals shot by Lieutenant Colonel J.J. Harrison of Brandesburton Hall near Hull. The collection was given to Scarborough Corporation by his widow Mary after Harrison's death in 1923. The collection was on display in the Scarborough Library until Wood End opened. Unfortunately, only 13 documented specimens from the Harrison collection survive but these do include a pygmy antelope *Hylamus harrisoni*, an adult male shot by Harrison in 1904 and thought to be the holotype.

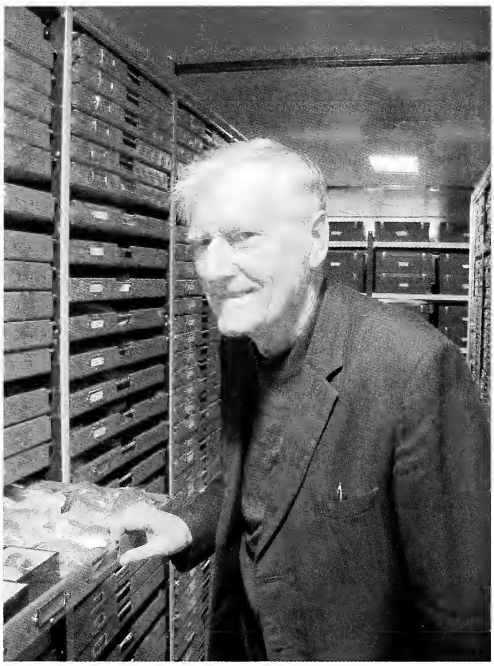
More recent acquisitions include the bird egg collections of Atholl Wallis and W.J. Gyngell, the W.J. Ploughden-Wardlaw collection of about 500 British and foreign bird skins and 9 metatarsi of an extinct moa species donated by Mr Boyle.

Due to a grant-aided project in 2000/01 most of the collection has received remedial conservation treatment, there has been extensive relabelling and recording and improvements to storage. Databases are now available for the herbaria, lepidoptera, mollusca, aves and mammalia collections. Between 2006 and 2008 the entire collection was packed and moved to temporary storage, then returned to new storage at Wood End. Inevitably, the location of some objects changed but the paperwork failed to keep pace; Scarborough Museums Trust staff are working hard to improve this situation.

Scarborough Museums Trust does not currently employ a curator of nartural history, so access to all the collections is by appointment with the Head of Collections (01723 284506; email: Karen.snowden@smtrust.uk.com) during office hours but other arrangements can be made in special circumstances. We have a clean and comfortable Enquiry Room available to researchers with access to a small but well-equipped laboratory and the internet. Researchers are advised to contact the Head of Collections a minimum of two weeks before they intend visiting. We recommend that enquirers complete the enquiry form on our website www.scarboroughmuseumstrust.org.uk and email it to us prior to their visit to ensure prompt and efficient service.

Obituary

Dr Robert Townend Pemberton 1933-2011



All who met Dr Pemberton came away with the same impression - a tall, imposing man with a very pronounced limp, the result of a childhood illness, usually dressed in a long raincoat and flat cap; he came over as the perfect gentleman. His sudden and unexpected passing was a great shock. Robert died in his sleep on the 10th of December, 2011, just a few days after I had spent a day working with him on the shell collections at the Leeds Museums Discovery Centre where he had spent many days over the past 20 years checking and identifying tropical marine shells on behalf of the museum.

Robert was educated at Salts School in Saltaire and showed promise from a very early age. He received a doctorate from Leeds University for his thesis *Studies on the Helminth Parasites of Birds in the North of England with Special Reference to their Distribution and Ecology*, completed in 1958. A copy is now lodged in the YNU library. Apparently, he examined 625 birds, the majority of which he shot himself and dissected to find and identify the various parasites. The examination of each bird would probably have taken several hours! Professor Spaul and Dr. Owen appear to have been the supervisors for his PhD.

His career choice took him into the West Yorkshire Blood Bank where he became a senior technician, publishing papers on haematology and using his field skills as an aid to the study and identification of blood types. Robert found that it was possible to extract a simple enzyme in the field from some species, e.g the freshwater snail *Viviparus viviparus,* which could enable the identification of blood groups of soldiers injured in battle. This principle was later used in research on 'Blue Baby' Syndrome.

Robert had a wide variety of interests ranging from gardening and fruit trees through parasites, fungi, molluscs (in particular freshwater mussels and tropical sea shells) to photography and railways. He was widely travelled. He visited the Falkland Islands in 1995 and again in 1998, when he also visited Ascension Island. He collected marine molluscs from these locations and bequeathed them to the Leeds City Museum.

A devout Christian, he left part of his estate to his local Methodist Church in Baildon and other materials to the National Railway Museum in York. His library of natural history books, maps, journals, etc. has been bequeathed to the Yorkshire Naturalists' Union with the instruction that any items from his library which the Union did not wish to keep could be sold to help purchase other volumes for the library. A long-standing member of the YNU and Treasurer of the Conchological Section, his mild-mannered and pleasant disposition at our meetings will be missed by all.

Adrian Norris

Book review

Lichens: An Illustrated Guide to the British and Irish Species. By Frank S. Dobson. Sixth revised and enlarged edition. 2011. Richmond Publishing Co. Ltd, Slough. Pp. 496, with keys, colour illustrations, distribution maps and thumbnail drawings. ISBN 978 0 85546 315 1 Paperback. Price £35.00; ISBN 978 0 85546 316 8 Hardcover. Price £50.00. (Plus £5.00 p&p).

Since its first appearance on the natural history scene in 1979, Dobson's *Lichens* has been the book to recommend to anyone wishing to engage with these fascinating symbiotic organisms. It offers a user-friendly approach to the subject for the neophyte and a compendium of necessary information and memory aids for the more experienced lichenologist. With each improved edition it has grown into a pretty ideal vademecum for the field and lab, easily portable in a rucksack, especially the surprisingly light new softback. It provides an undemanding guide to the taxonomy, identification and habitats of over 900 species, half of the species known from our part of the world.

A 20-page Introduction summarises the basics for the study of lichens in situ or as collected specimens, with hints on microscopical examination and chemical spot-testing. The common photobionts (algal or cyanobacterial partners in the lichen symbiosis) are described with accompanying sketches. The section on air pollution now deals quite fully with nitrogenous pollution and eutrophication, and a section on lichen communities is to be welcomed. Use of a hand-lens to interpret the distribution maps is rightly recommended, the maps being rather small in order to allow for the welter of other info in the book.

Keys to lichen identification form the next 420 pages. The generic key opens with a group key with drawings that will assist the beginner particularly, followed by a compact synopsis and then a detailed run through the genera, with the section on sterile crusts, always a problematic area, happily extended in this edition. The body of the book then proceeds alphabetically through the genera and the species within each genus. Frank Dobson, a professionally involved photographer, clearly believes like Carroll's Alice in books with pictures, and the generosity of illustration in *Lichens* has always been one of its strengths, almost every specific description having alongside an identikit photo.

Almost inevitably in a manual so crammed with data, proof-reading has sometimes failed. By way of example: in the Glossary "sporodochium" has become "sporochidium"; "*Catapyrenium cinerum*" (p. 123) should be "*C. cinereum*"; *"Leparia"* (p.54) should be "*Lepraria"*; and the description of "*Xanthoria ucrainica*" (p.472) is not helped by a companion photo showing numerous apothecia. One further point: the maps are no longer, as stated (p. 23) dot-based, but use squares where dots or diamonds might have aided clarity and helped interpretation even with a hand-lens in use. Nevertheless, such blips are unlikely to delay the user for long. Indeed, this reviewer mentions these examples largely looking forward to their being corrected in the seventh edition we should all hope to see.

British lichenology owes a great debt to Frank Dobson for his committed diligence over 32 years in making available a volume the earlier editions of which just about every lichenologist in the land must have found of real service. At the price, this sixth edition is a bargain waiting to be snatched up.

AH

YNU Bryological Section: Report for 2009-2011

T.L. Blockeel, 9 Ashfurlong Close, Dore, Sheffield S17 3NN
C. Wall, 3 St Mary's Road, Dunsville, Doncaster DN7 4DQ

Excursions

The following sectional meetings were held in 2009, 2010 and 2011.

Stainforth, Ribblesdale (VC64) 9 May 2009

At this meeting we recorded three parts of tetrad SD86I near Stainforth. We began at the disused Craven Lime Works where we examined the old quarry and kilns. The flora was interesting and included *Preissia quadrata*, *Campyliadelphus chrysophyllus*, *Ditrichum flexicaule* sens. str., *Distichium capillaceum*, *Didymodon acutus* and *Trichostomum crispulum*. We then moved on to Stainforth Scar, a little to the north, initially examining earthy ledges on the limestone grassland below the scar. An excellent find here was *Entosthodon fascicularis* growing with *Reboulia hemisphaerica*, *Tortula subulata* and *Weissia brachycarpa* on earth on a limestone ledge. *Schistidium elegantulum* was on a small boulder. The limestone rocks of the scar were rich, with *Frullania tamarisci*, *Metzgeria pubescens*, *Porella arboris-vitae*, *Scapania aspera*, *Isothecium alopecuroides*, *Homalia trichomanoides*, *Plasteurhynchium striatulum* and *Rhytidiadelphus triquetrus*, along with many common calcicoles. *P. striatulum* was a very good find, being a southern species with very few Yorkshire localities. Above the scar, *Campylopus fragilis* was found on a rock ledge.

We walked from the scar over to Cattrigg Force and the upper part of Stainforth Beck, a marked change in habitat with moist woodland banks and wet ground by the streams. Notable on a mossy rock was *Plagiochila spinulosa*, a western species here close to the eastern limit of its range. The woodland flora also included *Plagiochila asplenioides*, *Dicranum majus* and *Rhytidiadelphus loreus*, with *Nowellia curvifolia* and *Scapania nemorea* on rotten wood. Species on rocks included *Cololejeunea calcarea*, *Jungermannia atrovirens Preissia quadrata*, *Scapania aspera* and *Seligeria recurvata*. Not all the rocks were strongly calcareous and *Racomitrium aciculare*, *R. fasciculare*, *R. heterostichum* and *R. lanuginosum* were noted on more acid boulders. *Schistidium rivulare* and *Climacium dendroides* were in wetter habitats and *Zygodon conoideus* was recorded on Hazel.

This was a very successful meeting with a long list of species seen. 86 species were recorded at the limeworks and on the scar, and 71 species at Stainforth Beck.

Jumble Hole Clough, Calderdale (VC63) 10 October 2009

Earnshaw Water, the beck flowing through Jumble Hole Clough, had submerged *Hygrohypnum ochraceum* in abundance, with *Racomitrium aciculare* and *Scapania undulata* on gritstone at the waterline. The rocky banks held *Hyocomium armoricum*, *Dichodontium palustre* and fruiting *D. pellucidum*. On soil pockets were *Pogonatum aloides*, *Philonotis fontana* and an unidentified *Jungermannia*. *Pellia epiphylla* and a small patch of *Marchantia polymorpha* subsp. *polymorpha* were also in this area. Boggy ground by the beck had *Sphagnum fallax* in quantity, with smaller patches of *S. palustre*, *S. papillosum* and *S. denticulatum* present also. On drier ground in this area *Rhytidiadelphus loreus* was recorded. Fissures were present in the rocky banks and it was in one of these that Gordon Haycock found *Schistostega pennata*, its 'luminous' green protonema shining in the dim recess and the delicate pale green 'fronds' appearing after closer inspection. There were some large grit

boulders higher up the bank, and on one of these the massed red-purple gemmae of *Barbilophozia atlantica* caught the eye.

Epiphytes noted on Ash trees at the water's edge included *Frullania dilatata*, *Metzgeria violacea* (*M. fruticulosa*), *Cryphaea heteromalla* (on Sycamore), *Ulota bruchii*, *U. crispa* and *U. phyllantha*. The scarce leafy liverwort *Ptilidium pulcherrimum* was found in the fork of an old Rowan tree. Flushes higher in the meadow held *Brachythecium rivulare*, *Plagiomnium affine* and a very green, squarrose form of *Sphagnum palustre*. *Dicranoweisia cirrata*, oddly absent as an epiphyte, was seen with immature capsules on rocks in this area.

The stream valley was greatly incised further downstream and mixed woodland had colonised the steep banks. Amongst the usual woodland species were noted *Thamnobryum alopecurum* and *Thuidium tamariscinum*. On the south bank there was much rank vegetation with gritstone boulders. Here *Lepidozia reptans*, *Gymnocolea inflata*, *Calypogeia fissa*, *Plagiochila porelloides* and *Tetraphis pellucida* were found in humid niches.

59 species were recorded for the day. Thanks are due to our guide Charles Flynn, whose knowledge of this attractive yet secluded area was greatly appreciated.

Gunnerside, Swaledale (VC65) 8 May 2010
The aim of this meeting was to work Gunnerside Gill northwards from Gunnerside village. A short stop at the beginning of the day at Gunnerdale Bridge produced *Schistidium platyphyllum* and *Orthotrichum rivulare* by the River Swale. The dry spring meant that water levels in the gill were very low, making access along the stream relatively easy. We worked up the gill as far as the old lead mine and also took in the lower part of Botcher Gill. The Yoredale rocks in the gill range from mildly calcareous to moderately acidic. Moist rocks in the lower part produced *Cololejeunea calcarea*, *Leiocolea collaris*, *Amphidium mougeotii*, *Gymnostomum aeruginosum*, *Rhynchostegiella teneriffae*, *Seligeria donniana* and *S. recurvata*. On ledges were *Brachythecium glareosum* and *Hygroamblystegium varium*. Other records included *Porella cordaeana*, *Climacium dendroides*, *Dicranum majus*, *Pleuridium subulatum* (on a dry earthy bank) and *Schistidium robustum* (on a small limestone boulder). The epiphytic flora was moderately rich, with *Metzgeria violacea*, *Cryphaea heteromalla*, *Orthotrichum pulchellum* and *O. stramineum*.

In the Botcher Gill area, additional records included *Preissia quadrata*, *Scapania aspera*, *Mnium marginatum*, *Orthothecium intricatum* and *Seligeria trifaria* sens. lat. on limestone cliffs near the waterfall, and *Frullania tamarisci*, *Campylopus fragilis* and *Sphagnum quinquefarium* in the vicinity. Further north, near the old lead mine, we added *Ptilidium ciliare*, *Breutelia chrysocoma*, *Ditrichum gracile*, *Palustriella falcata* and *Tetraplodon mnioides*, the latter in its usual habitat on bone. We had a brief visit to the lead mine spoil, finding *Racomitrium ericoides* but none of the rare species tolerant of heavy metals.

The variety of habitat and rocks in the gill led to an impressive total of 138 species for the day.

Saltergate (VC62) 9 October 2010
Saltergate is one of the richest sites for bryophytes in the North Yorks Moors. The Havern Beck cuts a deep gully with waterfalls on its way down to Newton Dale and near its foot are some small areas of rich fen. Our route took us down the Havern Beck from Saltergate Bank. Low wet cliffs along the beck are notable for supporting a good population of the very beautiful and distinctive liverwort *Trichocolea tomentella* and we saw many fine patches of it,

mainly at the base of the cliffs. *Jungermannia atrovirens* and *J. pumila* were also seen. Near the waterfalls there are open cliffs and banks with some base enrichment in places. Records here included *Frullania tamarisci*, *Hygrobiella laxifolia*, *Leiocolea badensis*, *Lophozia incisa*, *Preissia quadrata*, *Scapania aspera*, *Amphidium mougeotii*, *Climacium dendroides*, *Distichium capillaceum*, *Fissidens adianthoides*, *F. osmundoides* and *Sphagnum russowii*. However, we failed to find *Moerckia flotowiana*, which was recorded here in 1997.

Later we located the area of rich fen near the railway, particularly notable for *Calliergon giganteum* and *Scorpidium scorpioides*, both of which were refound. Also present were *Campylium stellatum*, *Dicranum bonjeanii*, *Philonotis calcarea* and *Scorpidium cossonii*. On our return we noted a small amount of *Bartramia pomiformis* in a rock crevice on the steep bank above Havern Beck. The number of species recorded on the day was 108.

Croft-on-Tees (VC65) 7 May 2011
This meeting was intended to fill a recording gap for the forthcoming edition of the Atlas of British and Irish Bryophytes. The VC65 portion of hectad NZ20 had no previous records. Recording was concentrated initially on the churchyard, where both *Orthotrichum anomalum* and *O. cupulatum* were found. The main venue was Spoilbank Wood, owned by the Woodland Trust and located on the bank of the River Tees. We worked thoroughly northwest through the wood to the railway but it was rather disappointing bryologically, having a dense field layer of Ramsons and a host of Sycamores sloping down to the river. *Cirriphyllum piliferum*, *Eurhynchium striatum* and *Plagiochila asplenioides* were present on the woodland floor. Epiphytes were surprisingly poor but included *Isothecium myosuroides*, *Orthotrichum pulchellum, Metzgeria furcata* and *M. violacea*. *Leskea polycarpa* was quite common and fruiting on the old riverside Sycamores. Unfortunately, the heavens opened soon after midday, causing recording to be abandoned for the day. By that time, the number of species recorded was 38.

Washburn Valley (VC64) 15 October 2011
Bryologically, the Washburn valley is famous for the rich flora that develops in the draw-down zone of the reservoirs but other habitats in the valley are poorly recorded. The principal venue for this meeting was the block of mixed woodland at Dob Park. The woodland is on Millstone Grit and therefore acidic, with characteristic species such as *Dicranum majus*, *Plagiothecium undulatum* and *Lepidozia reptans*. The scarcity of rock and boulders limits the flora to some extent. Some scattered boulders at the southern end of the wood had *Scapania nemorea* and *Barbilophozia attenuata* and there were some good patches of *Dicranodontium denudatum* further to the north on raw humus and on the base of a birch tree. *Trichostomum tenuirostre* was found sparsely on wet rock in a small runnel. The most unexpected find, made by Colin Wall, was a patch of *Cololejeunea minutissima* on Bird Cherry, new to the vice-county. Yorkshire records of this species have been accumulating gradually in recent years, in response to improvements in air quality and probably also to warmer winters. It was unknown in the county before 2008 (apart from an old, unconfirmed record from Dentdale), being confined to southern and western regions of Britain. Other epiphytes included *Metzgeria violacea* and *M. consanguinea*. The number of species recorded in the wood was 57.

There was time for a brief visit to Lindley Wood Reservoir but most of the ground was either covered by water or was densely vegetated, partly with mats of *Crassula helmsii*. *Physcomitrium sphaericum* was present on one of the few bare patches of mud, among *Pseudephemerum nitidum* and *Pohlia camptotrachela*. A few years ago *Ephemerella readeri* was found on bare mud at Lindley Wood and was new to Europe, and we found a few stems

of it on our visit. It is a tiny moss, similar to *Physcomitrium sphaericum* but lacking a differentiated lid to the capsule.

British Bryological Society Spring Meeting

The British Bryological Society held its spring meeting in 2011 in the Yorkshire Dales, based at Scargill House near Kettlewell. Thanks are due to Gordon Haycock, who played a leading role in suggesting the venue and getting the meeting organised. It was a great success and has been reported in full in the BBS magazine *Field Bryology* (Blockeel, 2011).

Publications

Recent bryological publications for Yorkshire have included Colin Wall's comprehensive account of the bryophytes of Hatfield Moors (Wall, 2011) and Harry Lake and Joan Egan's article on bryophytes on colliery waste, which is mainly based on the South Yorkshire coalfield (Lake & Egan, 2011).

Records

The list below includes new vice-county records and other records of note. Abbreviations: BBS = British Bryological Society; NWNU = North-western Naturalists' Union; YNU = Yorkshire Naturalists' Union. † indicates a new Yorkshire record. * indicates a new vice-county record.

Regular recorders' names are abbreviated thus: T.L. Blockeel = TLB, C.Wall = CW, H. Lake = HL, J.Egan = JE, M.O. Hill = MOH

Nomenclature follows the current British Checklist and Census Catalogue (Hill *et al.*, 2008).

Aloina brevirostris: (63) SE6400 Auckley gravel pit, Doncaster, CW, 16 October 2009.

Antitrichia curtipendula: (63*) SE508171 on Elder, Brockadale NR, Kirk Smeaton, CW, 3 July 2010; SE7314 covering a horizontal willow branch, Thorne Moors (Pony Bridge Wood), CW, 1 November 2011. The occurrence of *Antitrichia* in South-west Yorkshire is remarkable. Throughout the twentieth century it declined severely over most of England and Wales, apparently because of industrial pollution. Unlike many other epiphytes, it is slow to recover lost ground as it rarely produces capsules in Britain. It is more commonly found in upland areas on rocks and boulders.

Aphanorrhegma patens: (61) SE822499 damp mud, Kilnwick Percy, Pocklington, CW, 17 September 2010; (63) SE4103 Wombwell Ings, HL, 12 October 2010; SK6397 damp pond bed, Gravel Hill Plantation, Rossington, CW, 25 October 2010; (64) SE4955 mud of dry pond near Skip Bridge, Wilstrop, TLB, 21 October 2011; SE568385 bare soil by track at edge of arable field, Cawood, TLB, 14 September 2010.

Atrichum tenellum: (63†) SK234907 mixed with *A. crispum*, *Pohlia bulbifera* and *Solenostoma gracillimum*, Dale Dike Reservoir, TLB, 20 November 2011. This species may be overlooked on reservoir margins.

Barbula convoluta var. ***sardoa***: (61*) SE867454 on limestone rockery in a neglected garden, 'The Wilderness', site of Londesborough Hall, CW, 25 August 2010.

Brachythecium mildeanum: (64*) SD9764 car park of caravan site, Threshfield, MOH, BBS excursion, 10 April 2011; (65*) SD918866 on rotting log in marsh, 250m alt., Semer Water, TLB, BBS excursion, 8 April 2011. *B. mildeanum* often occurs in weedy habitats and is probably under-recorded.

Brachythecium salebrosum: (63*) SE7414 near base of willow in wet carr woodland, SE edge of Thorne Moors, TLB *et al.*, YNU excursion, 30 April 1988.

Bryum moravicum: (61) SE7724 pollarded tree bole, Saltmarshe Delph NR, CW, 13 January 2011; TA1159 Hawthorn, Barf Hill Wood, Great Kelk, CW, 8 August 2009.

Bryum pseudotriquetrum var. ***pseudotriquetrum***: (64*) SD9572 wet calcareous rocks by small

waterfall, Knipe Scar, Kettlewell, TLB, YNU excursion, 4 July 2009. This is only a 'technical' new record: the var. *pseudotriquetrum* has not been consistently separated from var. *bimum* in the past and it is necessary to record confirmed vouchers of var. *pseudotriquetrum*.

Bryum pseudotriquetrum var. ***bimum***: (63) SE7415 peat bog, Thorne Moors (Will Pits), CW, 30 April 2011.

Bryum radiculosum: (65*) SE113904 on foot of parish church wall, facing west, 170m alt., Leyburn, M Pool, BBS excursion, 11 April 2011.

Bryum ruderale: (61*) SE8360 thin soil overlying chalk, chalk pit, Thixendale, CW, 4 October 2011.

Campylostelium saxicola: (62) NZ8803 top of large boulder in stream, Falling Foss near Littlebeck, TLB, 16 August 2010.

Cololejeunea minutissima: (61) TA1837 on Sycamore, The Moors, Burton Constable, CW, 20 May 2010; (63) SK32458273 on Norway Maple, Ecclesall Wood, by footpath just N of road, O Pescott, 22 January 2011; (64*) SE18965048 on Bird Cherry, Dob Park Wood, Washburn Valley, CW, YNU excursion, 15 October 2011. As noted in the report on the Dob Park excursion, *C. minutissima* has been spreading northwards and eastwards in recent years.

Colura calyptrifolia: (64) SD825790 on spruce twig in plantation near High Greenfield, Langstrothdale, TLB, 28 March 2011; (65*) SD774837 on spruce twig, north side of Blea Moor, Dent Head, TLB, 29 March 2011. *Colura* is another species that has extended its range in recent years. Historically it was a strictly oceanic species, mainly occurring on rocks in humid ravines. It now occurs widely as an epiphyte often, but not exclusively, in conifer plantations where the tree cover maintains high humidity. There is only one previous Yorkshire record, on rock in Twisleton Glen, Ingleton, where several other oceanic species occur.

Conocephalum conicum sens. str.: (63*) SK5382 muddy soil on stream bank, Anston Brook, Anston Stones Wood, CW, 5 October 2009. This is confirmation of *C. conicum* sens. str. following recognition of the very similar *C. salebrosum* as a distinct species.

Conocephalum salebrosum: (62*) SE847946 moist recess in stream gully, 190m alt., Hasvern Beck, Saltergate, TLB, YNU excursion, 9 October 2010.

Dichodontium flavescens: (65*) SD933976 limestone slab at edge of stream, Oxnop Beck by junction with River Swale, TLB, YNU excursion, 13 August 2011.

Dicranum majus: (61*) SE6640 mixed woodland, Danes Hills, Skipwith, CW, 24 January 2011.

Dicranum polysetum: (63) SE3502 pit spoil, Barrow, HL & JE, 11April2011; SE3904 pit spoil, Darfield, HL, 8 August 2011. *D. polysetum* is a rare species in Britain and its occurrence on former colliery sites is of great interest.

Didymodon tomaculosus: (64) SE568385 bare soil by track at edge of arable field, Cawood, TLB, 14 September 2010.

Discelium nudum: (63) SD99280926, Castleshaw Reservoir, D. Callaghan, NWNU excursion, 21 November 2009.

Ditrichum flexicaule sens. str.: (64*) SD8266 flat area of quarry spoil, 200m alt., Craven Lime Works, Stainforth, TLB, YNU excursion, 9 May 2009. This is *D. flexicaule* sens. str., following recognition of the segregate species *D. gracile*.

Ditrichum gracile: (65*) NY80V Keld, Kisdon Force, TLB, YNU excursion, 25 July 2009; NY940011 on ledge of limestone crag in gill, 430m alt., Gunnerside Gill, Swaledale, TLB, YNU excursion, 8 May 2010. This is confirmation of *D. gracile* sens. str. in the vice-county. It is commoner in the Dales than *D. flexicaule* sens. str.

Ditrichum plumbicola: (64†) SE02646506 fine-textured lead-mine waste, Hebden Beck near Grassington, MOH, BBS excursion, 10 April 2011; (65*) NY910009 old lead mine spoil, East Grain, Swinner Kirk Gill east of Keld, JG Duckett, 13 June 2009. This is a nationally rare species, tolerant of heavy metals and confined to old lead-mine spoil.

Entosthodon fascicularis: (64*) SD824669 soil in turf overtopping limestone ledge, field below Stainforth Scar, TLB, YNU excursion, 9 May 2009.

Entosthodon muhlenbergii: (65*) SD911855 on soil on limestone rock ledge, 280m alt., Park Scar near Marsett, Raydale, TLB, YNU excursion, 8 April 2011.

Ephemerella readeri: (64†) SE24 exposed mud, Lindley Wood Reservoir, EJ Hooper, 2006; SE208499 Lindley Wood Reservoir, TLB, YNU excursion, 15 October 2011. The original discovery of this species is described in full by Hooper *et al.* (2006). *E. readeri* was previously unknown in Europe and it is uncertain whether or not it is a recent arrival, perhaps brought in by water-fowl. It has also been found in Devon.

Fissidens crassipes: (63) SE6218 canal at Pollington, CW, 18 August 2009; SK5482 Lindrick Dale near Worksop, CW, 8 August 2010.

Fissidens exilis: (61) SE8249 Kilnwick Percy, Pocklington, CW, 17 September 2010.

Fissidens osmundoides: (63) SE0212 Haigh Clough, HL, 17 April 2010.

Grimmia donniana: (63) SD9909 Castleshaw Reservoir, D Callaghan, NWNU excursion, 21 November 2009.

Grimmia hartmanii: (65*) SE0586 on boulder, 470m alt., Penhill Crags, M Lüth, BBS excursion, 11 April 2011. This is the first record of this species on Carboniferous rocks in Yorkshire. Previous records are from Silurian rocks in the Ingleton district.

Hygroamblystegium varium: (65*) SD9499 on muddy rock ledge by stream, Gunnerside Gill, Swaledale, TLB, YNU excursion, 8 May 2010.

Kurzia trichoclados: (63) SE0508 Black Moss, HL, 26 April 2010; SE0807 Marsden Clough, HL, 10 October 2009; SE101105 Holme, HL, 28 September 2009.

Leiocolea badensis: (64) SE5353 on basic rubble on path, Bishop Wood, Selby, TLB, 14 September 2010.

Leptobarbula berica: (61) SE6844 horizontal gravestone, Wheldrake Churchyard, CW, 8 February 2011.

Lophocolea semiteres: (61) SE6646 stump in Wheldrake Wood, CW, 8 February 2011; SE6749 Rabbit Warren (south) Dunnington, CW, 20 February 2011; SE7724 rotten tree stump, Saltmarshe Delph NR, CW, 13 January 2011; SE7547 Allerthorpe Common, CW, 21 March 2011; (63) SD992062 birch tree, Delph Donkey Line, Dobcross, A Bamforth, 8 October 2011; SE0509 Kirklees Way, HL, 22 April 2010; SE0613 Marsden, HL, 9 September 2010; SE1211 Scotgate, HL, 17 May 2011; SE1717 Hill Side, HL, 20 December 2011; SE1914 Lepton Great Wood, HL, 10 May 2011; SE3502 Barrow, HL & JE, 20 November 2010; SE4303 Carr Head, HL, 22 March 2011; SE6904 Hatfield Moors (south-west), CW, 4 October 2010; SE713153 Thorne Moors, CW, 7 April 2009, SK2895 More Hall Reservoir, HL, 28 July 2011; SK696697 Finningley Sand Pit, CW, 31 March 2010. This is an introduced species, now clearly extending its range in the southern half of the county.

Metzgeria consanguinea: (61*) SE822499 willow bole in woodland by dried-up pond, Kilnwick Percy, Pocklington, CW, 17 September 2010; (63) SE1208 Upperthong, HL, 26 July 2010; (63) SE1110, Meltham Mills, HL, 19 August 2010; (64) SE5533 on willow, Bishop Wood, Selby, TLB, 14 September 2010.

Microbryum davallianum: (61) SE6828 soil beneath trees, Tidal Barrage, Barmby on the Marsh, CW, 6 November 2010; SE8460 chalkland hills, Thixendale, CW, 4 October 2011; (63) SE5514 Askern Colliery, CW, 20 November 2009; (64) SE4955 bare soil on road verge near Skip Bridge, Wilstrop, TLB, 21 October 2011.

Microlejeunea ulicina: (63*) SK29888333 oak, Limb Valley, Sheffield, JE, 2009.

Mnium stellare: (63) SE5401 Church Rein, Warmsworth, CW 19 February 2010; SK5482 Lindrick Dale near Worksop, CW, 8 August 2010.

Orthotrichum consimile: (63*) SE748142 Thorne Moors (Crowle Moor), CW, 11 March 2009. This epiphytic species has only recently been rediscovered in Britain. Further details are given by Blockeel (2008) and Blockeel & Wall (2008).

Orthotrichum sprucei: (64) SE2946 River Wharfe, Rougemont Wood, Weeton, TLB, 1 February 2011; SE343046 on willow, River Wharfe near Weeton, TLB, 1 February 2011.

Orthotrichum stramineum: (61*) TA1837 epiphyte on Ash, Moors Wood, Burton Constable, 20 May 2010, CW; (63) SE010814 Slaithwaite, HL, 19 March 2011; SE1015 Holme Mills, HL,

7 April 2011; SE1717 Hill Side, HL, 20 December 2011; SE2426, Birkby Brow Wood, Morley, MOH & CD Preston, 6 April 2011; SE7314 on willow, Thorne Moors (Pony Bridge Wood), CW, 1 November 2011.

Orthotrichum striatum: (64*) SD824785 epiphytic on branch of Rowan tree in small grove by forestry track, 395m alt., High Greenfield, Langstrothdale, NG Hodgetts, BBS excursion, 10 April 2012.

Philonotis caespitosa: (63*) SE0550309545 on slab of wet gritstone rock, c330m alt., Blakeley Reservoir, Wessenden, HL, 22 April 2010; SK2895 More Hall Reservoir, HL, 28 July 2011.

Pogonatum aloides: (61*) SE8837 sandy ditch bank by footpath, Houghton Moor, North Newbald, CW, 4 May 2011.

Pohlia cruda: (63) SK2894 Spout House Hill, HL & JE, 23 April 2011.

Polytrichastrum longisetum: (65*) SE030852 about boulders on clayey soil in weedy site with Bracken, c440m alt., south-east of Ringhill Scar near West Burton, O Moore & M Lawley, BBS excursion, 11 April 2011.

Ptilidium pulcherrimum: (63) SE1305 Raynard Clough, HL, 30 March 2009; SE7416 Thorne Moors (Will Pits), CW, 24 March 2009; (64) SE5633 on Ash tree by road through wood, Bishop Wood, Selby, TLB, 14 September 2010.

Racomitrium affine: (63) SK1696 on weakly basic sandstone boulder, Upper Derwent Valley, Stainery Clough, TLB, 30 May 2010.

Racomitrium aquaticum: (63) SE0907 Marsden Clough, HL, 19 October 2009; SE0410 Marsden, HL, 10 April 2010.

Racomitrium heterostichum: (65*) SE0586 on boulder, 470m alt., Penhill Crags, M Lüth, BBS excursion, 11 April 2011. This is the form lacking a hair-point, which may be a distinct species (*R. obtusum*).

Rhynchostegium megapolitanum: (64*) SE275682 among herbs on gritty soil on ledge of ruined wall, Fountains Abbey near Ripon, TLB, 24 July 2000.

Rhytidiadelphus loreus: (61*) SE843581 base of rotten tree stump, Beech/conifer plantation, Bradeham Dale, west of Fridaythorpe, CW, 12 September 2010.

Riccardia palmata: (62) SE9887 old log at edge of seepage, Forge Valley, TLB, 17 August 2010.

Riccia cavernosa: (61) SE6538 soil between paving slabs, Skipwith Churchyard, CW, 11 July 2011; SK6397 damp pond bed, Gravel Hill Plantation, Rossington, CW, 25 October 2010.

Ricciocarpos natans: (64*) SE55203267 among Yellow Flag on dried bed of pond, Bishop Wood, Selby, TLB, 14 September 2010.

Sarmentypnum sarmentosum: (64) SD806790 in seepage east of Ling Mill Bridge, TLB, 28 March 2011.

Scapania umbrosa: (63) SK2794 Spout House Wood, HL & JE, 23 April 2011.

Schistidium apocarpum sens. str.: (62*) SE846947 on large base-rich boulder in stream bed below waterfall, c170m alt., Saltergate Gill, c5km north of Lockton, TLB, YNU excursion, 9 October 2010; (64*) SD8367 on boulder in gully in limestone gill, 260m alt., Stainforth Beck, TLB, YNU excursion, 9 May 2009. This is *S. apocarpum* sens. str., which is less common in Yorkshire that the segregate species *S. crassipilum*.

Schistidium crassipilum: (61*) TA316226 on church wall, 15m alt., Patrington church, Holderness, P Martin, 2009.

Schistidium elegantulum: (64*) SD824669 lightly shaded limestone, field below Stainforth Scar, TLB, YNU excursion, 9 May 2009.

Schistidium rivulare: (63) SD9909 Castleshaw Reservoir, D. Callaghan, NWNU excursion, 21 November 2009.

Scleropodium cespitans: (61*) SE6936 horizontal willow bole, North Duffield Carrs NR, CW, 11 July 2011; SE8645 limestone rockery by pond in neglected garden, Londesborough Wilderness, CW, 25 August 2010; TA1565 grassy roadside bank, Bessingby, CW, 21 April 2011; (63*) SK5196 stone garden wall, Clifton near Conisbrough, CW, 28 April 2010. The natural habitat of *S. cespitans* is on tree bases and rocks in the flood zone of rivers but it is now also widely found in weedy habitats, including tarmac pavements.

Scorpidium revolvens: (63) SE0508 Black Moss, HL, 26 April 2010.

Seligeria calcarea: (61) SE7963 Leavening Brow, CW, 12 April 2011; TA0178 lane side/chalk scree, Staxton Brow, CW, 25 April 2011.

Seligeria calycina: (61) SE8055 Bishop Wilton Wold, CW, 20 September 2011.

Seligeria recurvata: (62) SE9886 Forge Valley, TLB, 17 August 2010.

Sphagnum angustifolium: (63*) SD992092 in rush mire on moorland below Castleshaw Lower Reservoir, D Callaghan, NWNU excursion, 21 November 2009.

Sphagnum capillifolium subsp. ***capillifolium***: (62*) SE848941 forming hummock on moorland bank, Saltergate Gill, TLB, YNU excursion, 9 October 2010. *S. capillifolium* is a widespread species but subsp. *capillifolium* has not been separated consistently from subsp. *rubellum* in the past, and indeed separation of the two subspecies can be difficult.

Sphagnum compactum: (63*) SE717157 in mire with *S. palustre* and *S. subnitens*, Thorne Moors, CW, 8 December 2009.

Sphagnum girgensohnii: (63) SK2786 Wyming Brook, HL & JE, 15 October 2011.

Sphagnum russowii: (63) SE0509 Kirklees Way, HL, 22 April 2010.

Syntrichia virescens: (61*) TA316226 on church wall with *Tortula muralis*, 15m alt., Patrington church, Holderness, P Martin, 2009

Tortella bambergeri: (64*) SD8682 limestone rock in south-facing grassland, c400m alt., Nethergill, Oughtershaw, NG Hodgetts, BBS excursion, 8 April 2011.

Tortula modica: (61*) SE6828 soil between tree roots, Barmby on the Marsh, Tidal Barrage Amenity Site, CW, 6 November 2010; (63) SE5514 Askern Colliery (site of), CW, 20 November 2009; (63) SK3589 Burngreave Cemetery, HL & JE, 10 September 2011; SK5383 Anston Stones Wood, CW, 5 October 2009; SK6697 Finningley Sand Pit, CW, 31 March 2010.

Zygodon conoideus var. ***conoideus***: (61*) TA1159 on Elder, Barf Hill Wood, Great Kelk, CW, 8 August 2009.

References

Blockeel, T.L. (2008) *Orthotrichum consimile* in Derbyshire. *Field Bryology* 94: 23–26.

Blockeel, T.L. (2011) BBS spring meeting 7-12 April 2011 - Wharfedale, Yorkshire. *Field Bryology* 105: 56–67.

Blockeel, T.L. & Wall, C. (2008) *Orthotrichum consimile*: another English record and a postscript. *Field Bryology* 96: 26–27.

Hill, M.O., Blackstock, T.H., Long, D.G. & Rothero, G.P. (2008) *A checklist and census catalogue of British and Irish bryophytes, updated 2008.* Middlewich: British Bryological Society.

Hooper, E.J., Duckett, J.G., Cuming, A.C., Kunin, W.E. & Pressel, S. (2010) *Ephemerella readeri* Müll. Hal. (*Physcomitrella readeri* (Müll. Hal.) I.G. Stone & G.A.M. Scott, Funariidae, Bryophyta): a genus and species new to Europe. *Journal of Bryology* 32: 256–264.

Lake, H. & Egan, J. (2011) Bryophytes on colliery waste. *Sorby Record* 46: 50–57.

Wall, C. (2011) The mosses and liverworts of Hatfield Moors. *Thorne & Hatfield Moors Papers* 8: 52–78.

Book reviews

Porritt's Lists: A reprint of George T Porritt's Yorkshire butterfly and moth records first published in 1883/86, 1904, 1907, 1922 revised into modern order with detailed comments and background. *Howard M Frost, Harry E Beaumont, Terry J Crawford, Geoffrey Fryer and Chris S V Yeates,* Butterfly Conservation Yorkshire and the Yorkshire Naturalists' Union, 2011 pp.320. ISBN 978-0-9562216-2-9; £20.00 from John Newbould, Stonecroft, 3 Brookmead Close, Sutton Poyntz, Weymouth DT3 6RS.

The long title is an accurate description of the book's contents. George Porritt was an eminent nineteenth century lepidopterist who compiled the first comprehensive list of the Lepidoptera of the historic county of Yorkshire. His original list was compiled in the 1880s and published in parts in the *Entomological Transactions* of the YNU. A revised list was published in the same journal in 1903-4. A third list was published in the Yorkshire volume of the *Victoria County History* in 1907. These lists are supplemented by a list for Hull produced by Porritt for a British Association visit in 1922.

Porritt's lists are the base point for any work on the distribution of Yorkshire Lepidoptera and the changes to it. They were used in that way in Sutton and Beaumont, the standard post-war work on the subject[1] and continue as a source of reference for the production of the annual *Lepidoptera Reports* produced jointly by the YNU and Butterfly Conservation. In the face of the observed and anticipated changes in distribution consequent upon climate change, Porritt's lists will continue to be used in the future and arguably are becoming more not less important than in the immediate past.

However, until now, using those lists has been far from easy. For a start they are not simply cumulative so that you can concentrate only on the most recent. Apart from revisions and reappraisals of the material, the 1922 list is no more than a supplement for part of the county and the list in the Victoria County History, probably because of limitations of space, and is less informative than the earlier ones. Additionally the sources are hard to find and difficult to access and in one case positively obscure. There is also the problem of nomenclature. Scientific names change and many will have changed several times in the intervening century. Curiously, because of the nineteenth century enthusiasm for collecting Lepidoptera, vernacular (English) names are generally agreed and have stayed surprisingly constant, changing only, as with the genus *Oligia*, where one species has been reclassified as several. However vernacular names exist only for butterflies, macro moths and a few micros. Most micros, and hence most moths have no vernacular names.

All of these difficulties are resolved in the volume under review. Leading Yorkshire Lepidopterists of the 21st century: Howard Frost for butterflies; Terry Crawford for macro moths and Harry Beaumont for micro moths have collated Porritt's comments. Organised by the species numbers in Bradley's Checklist[2], Porritt's comments in each of his lists is given. Page references to the originals and the original scientific name are included. The text is liberally coloured. Modern species name and number are in grey, dates of Porritt's lists in

---

[1] S.L. Sutton and H. E. Beaumont (1989) *Butterflies and Moths of Yorkshire. Distribution and Conservation*, YNU Doncaster Museum

[2] J D Bradley (2000) *Checklist of the Lepidoptera Recorded from the British Isles*, 2nd revised ed. Fordingbridge.

red, editors' comments in two shades of blue, with a band of cream down the inside of each page. The overall effect should be ghastly and confusing but curiously isn't; in fact it is quite pleasing. The guide to using the text is clear and engagingly sign-posted. The text is copiously illustrated by coloured photographs by Chris Yeates of specimens from the Porritt collections together with a few contemporary sepias of townscapes and people and one or two modern species photographs. Geoffrey Fryer has provided a biography of Porritt, emphasising his role as an entomologist observing the remarkable growth in industrial melanism in the late nineteenth century. Like Geoffrey apparently he was sceptical of the standard explanation. The book incorporates a Weather Summary 1800-1924 by Roy Bedford together with a brief discussion of bad weather years that Porritt experienced. Text boxes include a history of light traps and (joy of joys!) a summary of the various precursors of *The Naturalist*.

This pleasingly produced volume is too small for a coffee table but, as an A5 (or thereabouts) glossy soft-back, will fit snugly on a packed bookshelf. Produced in time for the 150th anniversary of the founding of the YNU and a celebration of one of its illustrious founders, I recommend it.

As an illustration of the book's utility and as encouragement to lepidopterists to buy it, a final comment on melanism. When I started trapping moths on Headingley Hill in the mid-1970s, I caught only black peppered moths; now I catch only white ones. Despite being a southerner and hence more or less new to melanism in the field, this did not much impress me, since I caught so few specimens in any event - only one or two a year. I was much more impressed by the large number of marbled minor aggregates (*Oligia strigilis, O. versicolor*, and *O.latruncula*; these species can only be separated by examination of the genitalia and were not separated in Porritt's day) that I caught, all of which were black. I continued to catch only black specimens until well into the `noughties' and even now, long after melanic peppered moths have disappeared, over two thirds of my catch is still black. I have wondered why marbled minor aggregates didn't feature in the early discussions of industrial melanism. This book provides the answer. In Porritt's day only half of the specimens were melanic and this proportion seems to have been fairly stable. This means it wasn't particularly striking but it also means that since then (at least on Headingley Hill!) melanism has worsened and has yet to get back to the late nineteenth century state. Here is something to think about.

JB

Guide to British freshwater macroinvertebrates for biotic assessment compiled by Simon Pawley, with contributions from Michael Dobson and Melanie Fletcher, 80pp. Freshwater Biological Association. ISBN 978-0-900386-79-4. 2011. Softback. £25.

This guide is an abridged version of a more comprehensive work on the larger freshwater invertebrates of Britain which was published in the same year. It provides an easy means of identification of these animals at the family level - in the jargon these are called "family based biotic assessment systems". It is essentially restricted to benthic forms though many of the animals concerned can swim quite well. Some 141 families, some containing more than a few species, are included, which gives some idea of the diversity to be found in such habitats. One of its intended uses is to give an indication of water quality for those who seek to assess the wellbeing of communities, usually of rivers.

Presentation is in the form of a key, first to the major groups and then to families, and relies heavily on illustrations, mostly of good quality. Even at this level the enormous diversity of our relatively depauperate fauna (compared with continental areas) is readily apparent. As well as serving the intended purpose, the guide may well stimulate the interest of naturalists to pursue studies on a particular group or groups. There is plenty of choice. The range includes flatworms, snails, leeches, crustaceans and a wide range of insects. Of the latter the Diptera alone embrace 24 families. The enormous diversity of form among this restricted element of our freshwater fauna is matched by that of their life cycles. While some groups are entirely aquatic, many representatives of the large insect component are aquatic only in their pre-adult stages.

Hints on what to look for when identifying the different groups are given, and technical terms, such as cerci and paraprocts, are cleverly defined in the keys, but one suspects that most users, and certainly beginners, will run their quarry down by comparing it with the illustrations. For the most part these are good but many of them could, with advantage, have been larger and there is plenty of space that could have been used in this way. A guide to further reading is provided, as is a millimetre scale on the back cover.

As an introduction to the diversity of one element of our freshwater fauna, this should certainly be a help to beginners and, one hopes, to its intended users, who are wisely advised by the authors that, for accurate discrimination, "definitive guides to identification" should be used. Some such guides are listed. One wishes this introduction well.

GF

Yorkshire Museum Gardens BioBlitz report

Sarah West

On the 15th and 16th of June, 50 naturalists and volunteers, over 100 primary school children, and around 500 members of the public did a BioBlitz of the Museum Gardens in York. The event was organised by Isla Gladstone and Emma Williams of York Museums Trust, Kerry Netherway and Paula McMillan of Natural England, Dan Jones, Mark Wills and Simon Pickles of the North and East Yorkshire Ecological Data Centre, and Sarah West of the University of York. The Gardens surround the Yorkshire Museum, and include the ruins of St. Mary's Abbey. It is a largely ornamental garden, but the Natural Sciences team at the Museum is very keen to improve its value for UK wildlife. One of the aims of the BioBlitz therefore was to obtain a baseline record of the wildlife currently on the site, and to better understand which areas of the gardens need improving. Another important aim was to introduce people to some of the wildlife that lives on their doorsteps, and to some of the conservation organisations that work in the area.

The dreadful weather in the preceding weeks and months, coupled with a few thunderstorms on the Friday and almost constant rain on the Saturday meant the species count was fairly low, just over 200 by the end of the day. The moth trap set by John Bowers captured a total of 2 moths! However, all those who attended the BioBlitz appeared to have a great time, some people stayed for nearly 6 hours! Just over 150 people took part in organised

activities, including a walk to see Tansy that the Museum has planted to attract the Tansy Beetle, worm surveys, fern walks, and of course "bug hunts" led by Roger Key, Steve Compton and Graham Banwell. These were particularly popular with children, although some of the parents confessed to enjoying it much more than they were expecting!

After returning from an activity, people were encouraged to bring back specimens to the BioBlitz Base Camp to try to identify their finds (See Plate VII, centre pages). Andrew Davis had a series of microscopes set up, which proved very popular, and there were also identification books and guides, and lots of volunteers on hand to help people identify what they had found. For many of the people attending, this was the first time they'd identified anything, and it was clear that they got a lot of satisfaction out of it. Several people took away species for identification, so if you still have records from the day then please send them in to the Records Centre (NEYEDC).

Thanks go to all the Yorkshire Naturalists' Union members who attended and helped with identification; none of this would have been possible without you.

Scarborough Festival of Ecology, June 2013

British Ecological Society

Following the success of the Scarborough Bioblitz last year, the Yorkshire Naturalists' Union has been awarded a grant from the British Ecological Society to run another public event in Scarborough as part of the national Festival of Ecology celebrating the BES Centenary.

The event will take place at the **Scarborough Spa** on the **14th and 15th June 2013**. The format of the event will be an environment fair with a wide range of organisations and community groups running activities and displays to engage, enthuse and educate the public about the wonders of the natural world, with a particular focus on the local environment. It is not a Bioblitz, although some activities might involve recording wildlife. We are very pleased to report that several of the organisations who helped make the Scarborough Bioblitz such an enjoyable and successful event have already agreed to take part in the Festival of Ecology.

If your organisation would like to participate by running an activity or a display on an ecological theme, we would love to hear from you. There is no charge for taking part and you are welcome to sell merchandise and recruit members. It is possible to participate on just one day if you prefer. We would also welcome offers of help with the event, whether you prefer to be 'behind the scenes' or with the public, there's plenty for everyone to do!

Please contact Paula Lightfoot via p.lightfoot@btinternet.com or 01904 449675.

YNU Notices

The **YNU Annual General Meeting** will take place in the **Jubilee Room** at the Bramall Learning Centre at the Royal Horticultural Society Garden **Harlow Carr** in Harrogate on **Saturday 24th November*** from **2.00pm** to 5.00pm, with a talk by **Dr. Roger Key**.

There will be an open meeting of the Natural Sciences Committee from 11.30am to 12.45pm, which all members are welcome to attend, with refreshments from 11.00am. Please let us know if you plan to attend this meeting so that we can ensure sufficient seating is available.

A picnic lunch will be provided by Betty's Café Tea Rooms at £8.50 per person and will include vegetarian options. If you would like to book lunch at the AGM please contact the YNU's Administrative Officer Claire Neill on membership@ynu.org.uk or c/o NEYEDC, St William's College, 5 College St, York YO1 7JF. There will be an opportunity to look around the gardens during lunch.

Venue: RHS Garden Harlow Carr, Crag Lane, Harrogate, North Yorkshire http://www.rhs.org.uk/Gardens/Harlow-Carr. Sat Nav users please use postcode HG3 1UE

* **Please note the change of date.** The AGM will take place on 24th November, not 17th November as published in the membership card.

New YNU website is live!

It has been a few months in the design and consultation stage, but finally we can announce that the YNU has a fab new website! It has been designed by Biskit Ltd., an independent Yorkshire-based marketing and design agency.

The website keeps the same URL as before - www.ynu.org.uk - and incorporates several new features including a Paypal facility for buying or renewing membership online, as well as ordering publications and tickets to the annual YNU conference. A Facebook group has also been set up, and is proving a very effective way of sharing photos and news about field meetings. Any YNU members who are on Facebook are encouraged to join this group: http://www.facebook.com/groups/146528302138921/

Special thanks must go to Paul Simmons and Dan Jones for all their hard work on the previous website over the past few years.

If Section Heads would like to update the contents on their own page, they can be given administrative access and training on how to do this.

Finally, the YNU would like to thank the website working group consisting of Craig Thomas, Jill Warwick, Hannah Droop, Paula Lightfoot, Paul Simmons and John Wint. This group steered the development of the new website and provided regular updates to the Natural Sciences Committee and the Executive. The working group has now been disbanded, having completed its task, and any future questions or suggestions about the website should be sent to the webmaster, Claire Neill, on webmaster@ynu.org.uk

Yorkshire Naturalists' Union

c/o NEYEDC, St William College, 5 College Street, York YO1 7JF
Tel: 01904 641631 Email: membership@ynu.org.uk
Website: www.ynu.org.uk
Registered Charity No. 224018

The Naturalist

This publication is issued free to individual members of the Yorkshire Naturalists' Union and to Affiliated Societies. The Editorial Board of *The Naturalist* is currently:

J. Bowers, W. Ely, A. Henderson, A. Millard, P. Simmons, S. West

Notice to contributors

Contributors should indicate whether they wish their manuscripts to be subjected to anonymous peer review. All other manuscripts will be reviewed by the Editorial Board who at their discretion may send them to third parties for comment and advice.

Original articles should be submitted electronically as an MS Word document to Dr A. Millard at a.millard@leedsmet.ac.uk.

Please see *The Naturalist Guide to Consistency* on p77 of *The Naturalist* 1079 and please **avoid** the following:

- using tabs to tabulate information (please use MS Word table format or separate the column entries in a single row with commas and enter a paragraph mark at the end of the row).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482)

Contributors should ensure the accuracy of reference citations. The Editorial Board and Council accept no responsibility for opinions expressed by contributors.

Copy Dates:
April issue - **14 February**; August issue - **14 June**; December issue - **14 October**

© Yorkshire Naturalists' Union – 2012
Single copies may be made of single articles in this journal provided that due acknowledgement is made and the copies are for non-profit making educational or private use. Copying of more than one article or multiple copying of a single article is forbidden unless special permission has been obtained from the Yorkshire Naturalists' Union. Permission is granted for the use of brief quotations in published work provided that acknowledgement of the source is clearly stated but the use of substantial sections of text and any illustrative matter requires the express permission of the Yorkshire Naturalists' Union.

ISSN 0028-0771

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01682 2785

Yorkshire Naturalists' Union

MIX
Paper from responsible sources
FSC® C012290
www.fsc.org

DUFFIELD litho & digital
Printed by Duffield Litho & Digital
www.duffieldprinters.co.uk